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TEN YEARS IN SWEDEN

BEING

A DESCRIPTION

OF THE

LANDSCAPE, CLIMATE, DOMESTIC LIFE, FORESTS, MINES, AGRICULTURE, FIELD SPORTS, AND FAUNA OF SCANDINAVIA.

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a c.

BY

"AN OLD BUSHMAN,"

AUTHOR OF "BUSH WANDERINGS IN AUSTRALIA," "A SPRING AND SUMMER IN LAPLAND," ETC.

R x d 42 R d 12

"Here the dark woods with many a patriarch tree
In gloomy melancholy gaze on thee;
Here rocks on rocks up-piled upon the strand,
Seem the vast structure of some giant's hand.
While high above, the lucid meteors glow,
And veins of iron in the mountains flow."—TEGNÉR.

LONDON:
GROOMBRIDGE AND SONS, PATERNOSTER ROW.

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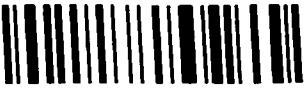
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TO

MY OLD FRIENDS IN SWEDEN,

IN REMEMBRANCE

OF MANY A HAPPY DAY SPENT AMONG YOU,

AND AS A

SLIGHT ACKNOWLEDGEMENT

OF MANY AN ACT OF KINDNESS RECEIVED,

THIS WORK IS

Dedicated

BY "AN OLD BUSHMAN."

INTRODUCTION.

THE man who sits down to write a faithful account of a foreign country, in which he has resided for any length of time, has, strange as it may appear, a far more difficult task before him, than he who travels hastily through it, takes as it were a bird's-eye view of the land and its inhabitants, jots down in his note-book his remarks on men, manners, and things in general, and then gives to the world a description of the country, and the people, as they appeared to him during a flying visit; a description too often coloured by hasty and erroneously formed opinions. It matters not to him whether he gives pleasure to the inhabitants of the country, which he may never see again, by a flattering remark, or wounds their feelings, by an ill-formed opinion. He finds fault with manners and customs, solely because he is unused to them. He is too apt to jump at conclusions and form ideas, which a closer study of the subject would often convince him were wrong, and on this account too much faith should never be placed, on the casual observations of a mere traveller.

But if such a man were likely to err by forming too hasty an opinion, he is nearly certain to avoid falling into an error from which a foreigner, who has resided for some years

in the country, will perhaps find it difficult to escape. The latter must necessarily have gained something like a partiality for the land (or he would not have remained in it); he must have received many an act of kindness from, and probably made many a good friend among, the people with whom he has been so long associated, and it would be an act of base ingratitude, to say nothing of its inconsistency, if after having, as it were, eaten of their salt for so long a time, he were to turn round and abuse his kind entertainers directly he left their board. But still, if a man once undertakes the grave task of describing a country, and the habits of a people, he has a public duty to perform, and unless he can draw the picture with an impartial hand, he had better by far leave it alone. To give praise only where it is due, to avoid unjust censure, and above all, never to sacrifice plain truth to flattery, should be his invariable motto.

Such, at least, shall be mine, and although I trust that not a single remark in the following pages will wound the feelings of a Swede, I hope that not one of my own countrymen will ever have it in his power at a future day to say he has been misled by my statements, or formed a different opinion of Sweden and the Swedes from a perusal of this book, than future experience will warrant him in retaining.

It is on this account that I set about my task with no little reluctance, fearful of being accused of partiality, for candour forces me to confess that my heart warms towards old Sweden. During more than ten years' residence in the country, I have invariably received the greatest kindness from all. From the first moment I set foot in the country, I was treated far more like a friend, than a stranger, and if ever

I was reminded that I was not one of them, it was to prove to me that the hearts of the good-natured Swedes warmed towards the foreigner. "I charge you nothing, *because you are a stranger,*" was the reply of a good doctor in Carlstad, who had attended me for three weeks in a case of ague, to my question as to what was his fee. This simple sentence spoke volumes. It would therefore ill become me to turn round and speak badly of the inhabitants of a country, after having for so long a time received daily proofs of their simple, warm-hearted kindness.

Among people like these, it is indeed a man's own fault if he cannot get on. I conformed as much as possible to the habits of the people among whom I was thrown, and was treated with uniform kindness and civility. I endeavoured to comply with their manners and customs, and did not—as too many English travellers are in the habit of doing—go about abusing and finding fault with trifles, or make invidious comparisons between this country and England. I behaved with courtesy to the gentlemen, with kindness and liberality to the peasants, and neither were thrown away. If I wished for fishing, or shooting, I never had the slightest difficulty in obtaining it, if I went the right way to work; and if ever I have met with any jealousy, it has invariably been at the hands of my own countrymen.

A want of kindness and courtesy towards the stranger is certainly not among the faults of the Swedes, and I can pretty confidently say, that there are few other countries in Europe, where an Englishman is better received than in Sweden.

English travellers are exploring every corner of the

globe, men now "scamper through" lands, which twenty years ago they knew only on the map, and I have no doubt that more than one traveller who has "done" Sweden, has given the English his opinion of the country and its inhabitants. But strange to say, the only book I know which gives anything like a correct idea of the country, and more especially of that talismanic attraction to the British wanderer, its "field sports," is Lloyd's "Northern Field Sports," and as that book was written some years since, and Sweden has, like all other countries, undergone a considerable change since that date, I make no apology for introducing this little work to the English reader; believing that many a brother naturalist and sportsman, would run over and enjoy a ramble in this land of "flood and fell," if he only knew how easily such a trip might be performed, and had something like an accurate idea of what sport he was likely to meet with, and what treatment he would receive at the hands of the inhabitants.

I may here observe, however, that I do not flatter myself that the contents of the following pages are altogether new or original. Of course I have been much indebted to others, for the information which they contain. Without Agardth's and Ljunberg's statistics, I could never have completed my task, and without the aid of Nilsson I should never have been able to lay before the reader, so complete an account of the Scandinavian fauna as I have done. I have, however, added much matter which has come under my own personal observation, and, whenever I have quoted anything I have taken as much pains as I could to ascertain its correctness. I therefore confidently think that the reader may pretty well rely upon the

truth of everything, which he reads in the following pages.

We have *no book* in England that I know of upon the Scandinavian fauna, which is, perhaps, as rich as that of any country in Europe; and I think, therefore, that the chapter relating to this subject will be found the most interesting in the whole book, giving, as it does, a complete list of every mammal, bird, reptile, and fish met with at the present day in Sweden, Norway, Denmark, and Finland, with the localities which each frequents, and notices of the habits of the rarer species.

For a great part of the matter contained in the chapter relating to the statistics, and general description of the country, its mines, and its forests, I am indebted to "Agardth's Statistics," a masterly and carefully compiled work, which ought to be in the library of every Swede.

Much of the chapter relating to the agriculture of the country, is from my own personal observations, during a ten years' residence among farmers in different parts of Sweden, and I beg here to observe that the opinions which I give are *solely my own*. I have certainly received a little assistance in the calculations, but nothing more. Many friends offered to revise this chapter for me, but I would not allow it; and if any of my ideas or surmises are wrong or ill founded, the whole fault rests upon my own shoulders.

My chapter on the domestic life of the Swedes is just what I found it myself, and I have given what little information I was able from my own experience respecting the field sports of the country.

I have done my best to render my book amusing as well as instructive. My "Spring and Summer in Lapland" gave

a good, but perhaps succinct, account of the fauna and field sports of that country, and my "Ten Years in Sweden" will, I trust, do the same as regards Sweden. I have taken equal pains with both, and, as in my Lapland book, so in the following pages, I have stated nothing for which I had not a good foundation.

But I must observe that if the reader expects to hear of perils and dangers incurred in the chase of the bear, or of extraordinary bags of game, or catches of salmon, he will be altogether disappointed. I never killed a bear all the time I was in Sweden, and as for my game book and fishing journal, I should be ashamed to show them to any brother sportsman.

But this has been my own fault. I could, I dare say, with very little trouble, have been in at the death of a bear, and I have lived in the vicinity of many excellent trout streams, without troubling myself much about the fish that were in them. Not that I am less fond of the sport than any other Englishman who has been bred to a country life. My time, however, has always been otherwise occupied, in studying the fauna of this magnificent land; and, except just when the snipe and ducks were well in, I seldom cared to fire a shot at any other bird than a rare specimen. Still my occupation of collecting has taken me from Falsterbo Reef to Quickiock, Lapland, and thrown me much among sportsmen of all grades. I have seen the country in various districts, and at different seasons. I have had good opportunities of studying the habits and dispositions of the lower classes, in my various collecting rambles, and I have read the character of the higher orders in that most searching of all tribunals, the privacy of the domestic circle.

With this preface I introduce my new work to the British naturalist, sportsman, and traveller; and if my "Ten Years in Sweden" is only half as well received as my "Spring and Summer in Lapland" has been, I shall be perfectly satisfied, and deem that my time and trouble have not been thrown away.

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TEN YEARS IN SWEDEN.

CHAPTER I.

General Statistical Account of the Country—Its Geographical Limits—Climate — Population — Vegetation — Mines — Forest — Agriculture — Manufactures—Commerce—Government and Religion.

THE entire area of the Scandinavian continent, including Sweden, Norway, and Lapland, may be computed at about 13,798 geographical square miles, or 292,700 square English miles, of which Sweden contains 170,000, and is consequently nearly three times as large as England and Wales together. The whole continent is under one government, ruled by the same king, although Sweden and Norway have separate parliaments, that of the former being called the "Diet," of the latter the "Storthing." Norway is much more democratic in its principles than Sweden, and I believe the laws are freer. The two countries hold much the same relative positions towards each other as England and Scotland, and about the same kind of feeling exists between the inhabitants of either country.

It has often struck me that there is a general resemblance between these four countries, and the manners of the people. The features of the Norwegian landscape are wilder and more barren than that of Sweden. The Swedes more resemble the English in many points of their character, the Norwegians the Scotch. Both nations appear outwardly to be on very good terms with each other, although they really, I believe, bear one another

no very hearty good will. Still I do not think that there is any likelihood, at present at least, of any serious break out between them. Upon my asking an old Swedish friend in a general way his opinion of the Norwegians, I received the following laconic reply: "There are two things they can do very well, deal in horses, and pack herrings;" and, doubtless, the Norwegians have much about the same exalted opinion of the Swedes. Of Norway, however, I know little or nothing. Sweden was my home during my residence in the north, and it is of Sweden and the Swedes alone that I shall speak.

The general features of the two countries (save that Norway is far less fertile, and more mountainous) and the habits of the people are much alike. One language will pass current in both, although there is a considerable difference in the pronunciation. The scenery of Norway is much grander, and the salmon rivers in that country are decidedly better than any we have in Sweden, at least they are far better known to the British fishermen, although for trout fishing I fancy one country is about as good as the other. As for shooting both countries are much alike. The same game abounds in both, and if a man is camped near the great dividing fell range between the two countries I don't believe it matters a pin on which side he were stationed. Of course knowing Sweden, I should prefer the Swedish side, and I may here remark that everything is much dearer (nearly 100 per cent.) in Norway than in Sweden. The people, as far as I could see, are prouder, and I do not believe the peasants are so accommodating (certainly more grasping) than in Sweden.

The total area of Sweden itself is 3868 Swedish square miles (or 8046 geographical), with a relative population of about 1000 inhabitants on each square Swedish mile. Norway has an area of 2761 Swedish square miles, with a population of about 550 on each square mile.

The only foreign possession belonging to Sweden is the little island of Saint Bartholomew in the West Indies. with about 3000 inhabitants.

According to Agardth the total area of Sweden is 3868 Swedish square miles; although its actual surface, on account of its mountains and valleys, is much larger. Of this about 498 Swedish square miles, or one-eighth part, is taken up by lakes, etc. (in Norway the proportion of lakes is as one-twentieth).

	Swedish square miles.
Lakes	498
Meadow and cultivated land .	247
Fells and barren plains . .	1500
Forests	1623
	3868

According to Hahr's chart, the whole area of Sweden, including lakes, forests, etc., but exclusive of islands, is now 80,825,056 tunnland or Swedish acres.

In 1656, under Charles Gustavus, the whole Swedish territory extended over 12,470 Swedish square miles; and in 1856 (200 years after), under Oscar I., it was reduced to about one-half, or 6625 Swedish square miles.

The surface of Sweden is not nearly so mountainous as that of Norway. The highest mountain in Sweden is Sulitelma, in Lulea Lapland, about 6342 feet above the level of the sea. The highest in Norway is Skagastolstend, about 8670 feet high. More than one-half of Norway lies higher than 2000 feet above the sea, and one-thirty-eighth of the whole land is covered with perpetual snow. While on the contrary in Sweden only about one-twelfth part of the whole country lies at so great an elevation, and about one-third of the whole land lies less than 300 feet above the sea, and south of the Dal river there is not a mountain 2000 feet high.

From Falsterbo Reef, the most southerly point of Sweden, to the North Cape (which, however, lies in Norway) it is about 1200 English miles as the crow flies, and the mean breadth of Sweden is 200. It is divided on the east from Russian Finland by the large Tornea, Munio, and Tana

rivers; from Norway on the west by a clearly defined fell range running right down between the two countries as far at least as the Lake Famund, where, strange to say, it branches off to the east, wanders through Sweden to the south, following the west coast of the Lake Vettern, thence through Suraland down into Scania, passes under the Baltic into the Island of Bornholm, where it again rises in Rittarknekten (500 feet high), one of the highest mountains in Denmark, the last of the great Scandinavian fell range.

On all other sides Sweden is encircled by seas; by the Bothnia and the Baltic on the east, by the Cattegat and North Sea on the south. Its extent of coast is 620 Swedish miles. It extends from 55° 20′ to 69° 4′ north latitude; and from 28° 26′ to 41° 50′ east longitude.

As I shall, especially in the present chapter, often have occasion to refer to the Swedish money, weights, measures and distances, I insert the following table (as they now stand) for a guide to the reader, adding that within the last two years, eleven alterations have taken place, especially in the weights and measures.

SWEDISH MONEY.

The money in circulation is calculated by—

Rix-dollars, Rixmint (rqr. rmt.).
Rix-dollars, Banco (rqr. bco.).
Skillings (sk.), both rmt. and bco.
Ore (ö.)
2 Ore are about equal to 1 skilling.
48 Skillings (100 öre) about equal 1 rqr. rmt.
1 Rqr. Rmt. and 24 sk. about equal 1 rqr. bco.

The Norwegian currency is rather different, more like the Danish.

In exchanging English money (and Bank of England notes or gold can be always changed in Gothenburg or Stockholm, and often in the country), the pound sterling

should realize 18 rqr. rmt., or 12 rqr. bco. The exchange, however, is varying, and I never yet obtained the full exchange, rarely, however, less than 17 rqr. rmt. and 50 ö. I may add now that an English bank is established in Gothenburg, the traveller or English resident in Sweden will in future be far more independent of the money changers on the Gothenburg Bourse, who have till now had a pretty good monopoly in their hands, and discounted English bills quite as if they were conferring an obligation on the seller, when they knew at the time that their own Swedish money was valueless in England.

Formerly fusty old paper notes as low as 3 ö. were in circulation. You now never see a paper note under 1 rqr., and these, with others for large sums up to 100 rqr., are in general circulation.

The old Swedish copper money was very curious. I have in my possession an old copper coin of 1731, value about 2s. 6d., 10 inches square, weighing about six pounds.

Every note is clearly and properly stamped with its value. I believe all the banks are pretty safe, but I fancy it would be as well for the traveller to procure Gothenburg or Stockholm notes, and by all means to have them as new as he can. When changing a large note, he will always find the changer anxious to slip in as many ragged old notes as he can. Refuse these at once, for perhaps up country they won't pass. Norwegian notes are as well refused also, for although they will pass on the border towns in Wermland and no doubt are as good as Swedish paper, they are often refused, and are always difficult to change. Moreover, such is the desire of the little dealers here to turn a penny, that I have actually had commission charged me on changing a Norwegian note worth about 10s. in a little Swedish town not far from the frontier.

But I cannot find much fault with this, for I recollect once on my passage from Gothenburg to Hull by one of the English boats, I wanted to pay my fare to the captain, an Englishman (whose business of course lay quite as much in

Sweden as in England), in Gothenburg notes, which I had just procured there in change for English money at the rate of 17 rqr. and 24 sk. to the English pound. He refused to take my Swedish money unless I gave it to him after the rate of 19 rqr. to the pound. Unfortunately I had only one pound English money, which I wanted to take me up to London, so I was obliged to comply with his demand. "Punch" used to have some joke about the "Great Eastern" being the greatest "screw" in the world, and I think this captain should have commanded her.

LONG MEASURE AND SUPERFICIAL.

This table is copied out of Lloyd's "Northern Field Sports," and has undergone no alteration since that Book was written:

1 Swedish foot is equal to 11$\frac{1}{16}$ inches English.
38 Swedish feet equal 37 feet English.
5416 Swedish feet equal 1 English mile.
1 Swedish ell (aln) is equal to 2 Swedish feet.
1000 Swedish ells equal 649 English yards.
1 Swedish mile or 18,000 Swedish ells equal 6 miles 1140 yards English.
1 Swedish square mile is equal to 324,000,000 Swedish square ells.
1 Swedish square mile is equal to 23,142$\frac{6}{7}$ Swedish tunnland.
10,000 Swedish square miles equal 440,666$\frac{2}{3}$ English square miles.
1 Swedish tunnland (or acre) is equal to 14,000 Swedish square ells.
100 Swedish tunnland equal 122$\frac{3}{10}$ English acres; 75$\frac{5}{10}$ Irish acres; 96$\frac{1}{10}$ Scotch acres.

CORN MEASURE.

The decimal system is now in general use, and all the French weights and measures, with their names, will probably be soon adopted. The cubit measure is now universally used in measuring corn, grain, etc.

1 Swedish tunna or barrel of corn is equal to $6\frac{3}{10}$ cubic feet, or $4\frac{13}{16}$ bushels English.

1 English bushel is equal to 1762 Swedish cubic feet.

The Swedish tunna is divided into 8 fjerdings, 36 kappa, 56 kanna.

LIQUID MEASURE.

1 Swedish ankar is equal to 15 Swedish kanna.

$1\frac{5}{11}$ Swedish kanna is equal to 1 gallon English, or in round numbers 1 English gallon is equal to $1\frac{1}{2}$ Swedish kanna.

1 Swedish kanna is equal to 2 stooks, 8 quarters, 32 jungfru.

$91\frac{1}{3}$ kanna is equal to 1 English hogshead.

WEIGHT.

Victuallic is the standard weight of the country, and the Swedish weights have lately been much simplified. The present weights are—

1 skalpund Swedish (sk.) victuallic is equal to $14\frac{14}{15}$ ounces English avoirdupois.

1 centner or cwt. (ctnr.) is equal to 100 Swedish skalpund.

32 lod equal 1 skalpund.

2 lod equal 1 uns (ounce) Swedish.

The old lispund (20 skalpund), and skeppund (20 lispund) are no longer in use.

1 skeppund or 400 skalpund equal 300 avoirdupois or 320 victuallic weight.

The total population of Sweden at the present day may be reckoned in round numbers at 4,000,000 or 500 on each geographical square mile. These are all of the old Scandinavian race, if we except a few foreign settlers, 10,000 Fins, 5000 Laps of Mongolian race (in Norway I believe there are 10,000 Laps), and about 1000 Jews.

The female sex, owing, it is said, to the wars in the seventeenth and eighteenth centuries, predominate over the males at the rate of about 1059 to 1000. The population of 1863 was just double that of 1767.

As may be supposed in such a country the population is

very unequally divided, and the southern provinces are just ten times more populous than the northern ones. The eighteen provinces lying south of Dalaroe, 60° north latitude, deducting the lakes, contain 2389 geographical quadrilateral miles, and their population in 1860 was 3,228,178, or 1357 to each geographical quadrilateral mile. While the six northern provinces whose area, exclusive of lakes, is 4839 geographical quadrilateral miles, contained only 631,550 inhabitants, or 130 to each geographical quadrilateral mile. Thus Malmo Land in the very south had 3478, whilst Norhotten, the most northerly province, had only thirty-nine inhabitants to each geographical quadrilateral mile. The proportion of the married people on land is about thirty-three per cent. In towns not more than twenty-five per cent., and in Stockholm not more than twenty-two per cent.

Stockholm is the capital town of Sweden, and the only one of any size. Its population in 1861 was 116,496. Next to this is Gothenburg, which has the principal English and American trade, with 38,504 inhabitants; Norrköping with 20,228; Malmö with 20,149; Carlscrona with 18,523; Gefle with 11,219, and all the rest with under 10,000.

About one-eighth of the whole population reside in towns; the other seven-eighths, or 3,500,000 are scattered over the country in villages, hamlets, or detached buildings.

Out of 100 children born between the years 1856 and 1859 in Stockholm forty-two were illegitimate; in the other towns seventeen; inland only seven (but this I think is too little, at least in the country where I resided).

So in the moral scale Stockholm appears to stand lower than any town in Sweden. It is singular that in Stockholm there appears to be a larger proportion of women over the men than in any town in Europe. In Stockholm French fashions, I believe, are more in vogue than English.

Most of the Swedish towns are well built, though still a great deal of wood is used in building (and in this country especially on land, I fancy a wooden house is better adapted to the climate than a stone one, as being much warmer). They are kept clean, lighted with gas, but usually ill-paved.

owing to the nature of the country; the environs of many are picturesque in the extreme.

The Swedish villages are generally ugly, and never built with any regularity. As everything must be kept under cover during winter, we never in the middle or north of the country see a well-filled stack-yard or a good straw-yard. The farm-houses are stuck here, there, and every where without any regularity, the outhouses often in a dilapidated condition, and so many buildings attached to each farm-house that two or three will almost form a small village of themselves. The churches, generally large, often standing far from the village, are usually painted clean white: and in the winter when the whole landscape is buried beneath a sheet of snow, a northern village has a most chilling appearance.

Some of the wooden churches are very curious, and the old belfry with its single bell (or clock as they call it here) is often detached. In each northern burial ground is a dead-house, where, during the winter all the corpses are deposited till they can break the ground to dig the graves in the spring.

Sweden is divided into three great lands and twenty-four provinces:—

	Swedish square miles.
1. Swea Rike, or Middle Sweden, with an area of	954
2. Göta Land, or South Sweden	844
3. Norrland, or North Sweden	2070
	3868

Swea Rike is divided into six provinces—Upland, Lodermanland, Westmanland, Nerike, Wermland, and Dalecarlia. This is the richest land in Sweden both for iron and timber. The scenery of this district is magnificent.

Göta Land is divided into ten provinces—Eastern Gotland, Western Gotland, Småland, Blekinge, Skane, Halland, Bohus Land, Dalsland and the Islands of Aland and Gothland.

This is by far the most fertile and populous part of Sweden. The country is flatter and more open than in any other part, is much better adapted to agriculture, and much of it lying on the coast, the climate is milder than in the interior.

Norrland is divided into eight provinces—Gestrikland, Helsingland, Herjedälen, Jemtland, Medelpad, Angermanland, Westerbotten, and part of Lapland.

This is the wildest, barrenest, and yet, perhaps, the most picturesque part of Sweden. It is little adapted to agriculture, but is in many parts rich in minerals, which cannot, however, in the present state of the country, be rendered of much use to man. The forests are large, but inaccessible in many places. The timber gradually seems to become poorer the further north we travel; and in the very north the land, save that it affords a scanty sustenance to the few inhabitants that are scattered over its surface, appears to be of very little value to the rest of the country.

The Climate.—As may well be expected, in such a diversified and wide-stretched land, the climate is very variable; and the north, the middle, and the south of Sweden have each a climate of their own. The difference of the mean yearly temperature in the south of Sweden and the north (Lund and Enontekeis) is 10° 04′: in Norway, between Christiania and the North Cape 4° 1′. Still the Swedish climate may be considered as healthy, and, for its high northern latitude, mild. In the south and south-eastern provinces it differs little from that of many parts in north Scotland. The cold is never very severe in the winter. There is rarely any sledging. The spring comes on at least a month earlier than in the midland districts (where the snow generally lies on the ground till far into April), and by about April the spring sowing in the south is usually finished. The country in the south is open, and many of the woods have a true English character. The soil in some places is rich and good, but there are many large open sandy plains and turf mosses, and wide barren tracts of heather mark the spot where the southern forest once stood. The mean yearly temperature

of Lund in Scania lying in 55° 42′, at an elevation of sixty feet above the sea may be reckoned at 7° 28′ C.*

In Lund the longest day is 17h. 28m., and the shortest 6h. 15m. In Christiania, in Norway, the mean yearly temperature is + 5° 36′; in Gothenburg, + 7° 97′; in Copenhagen, + 7° 92′.

In the middle of Sweden the winters are long and severe; but, strange to say, the climate appears to be altering, for I often hear the old hands regret that we rarely have now one of the old-fashioned Swedish winters.

It certainly does appear that, of late years, the winter sets in later, and lasts longer into the spring. The summer is delightful when it fairly sets in, but the spring itself is not so pleasant as in England, for there is very little interregnum between winter and summer here, and the spring in the midland and northern districts is often only a long thaw.

In 1864 the spring was exceedingly backward, and we had no real summer weather up to June 1st. We generally had —2° C. of frost at night in Wermland. The oats were not planted till about the middle of May; the potatoes scarcely till June, and on June 1st the trees could hardly be said to

* In Sweden the Centigrade (or as it is also called, from its author, the Celsius) thermometer is used. In England that of Fahrenheit. 9° F. = 5° C. The way to convert Fahrenheit into Centigrade is to deduct 32, then multiply by 5 and divide by 9; thus: $\frac{212° \text{ F.} - 32 \times 5}{9} = 100° \text{ C.}$ If you want to convert Centigrade into Fahrenheit you must multiply by 9 and divide by 5, and then add 32; thus: $\frac{100° \text{ C.} \times 9}{5} + 32° = 212° \text{ F.}$ The addition and subtraction of 32 is owing to that difference in the freezing point of the two scales. As F. stands for Fahrenheit, so C. expresses Centigrade, or Celsius. The following table shows some of the corresponding points after two grades;—

212 F.	equals	100 C.	
200 „	„	93.33 „	
140 „	„	60 „	
100 „	„	37.77 „	
60 „	„	15.55 „	
50 „	„	10 „	
32 „ (freezing point)	„	0 „	freezing point.
0 „	„	17.77 „	

be well in leaf, and yet we had an excellent harvest. The summer is either very dry and hot or very rainy.

The yearly downfall of rain, snow, and hail appears to be scarcely one-fifth so heavy as in tropical lands, but rather greater on the west coast than on the east. According to Forsell, in the middle of Sweden, in an average of thirty-six years, it did not exceed 17½ inches yearly. The hottest month is July, and the coldest is February.

The mean yearly temperature at Stockholm in 59° 20′, 128 feet above the sea, is reckoned at + 5° 7′, and the cold had once been known there as great as —32° C. In Stockholm the longest day is 18½h.; the shortest 5h. 54m. At Umea the mean yearly temperature is + 2°, and at the North Cape the same.

I insert a table of the lowest and highest temperature in every month for the last seven years after centigrade kept at Gardsjo, Wermland, lying in 59⅓° north lat.

	JANUARY.			FEBRUARY.	
1857	— 20	+ 5	1857	— 12	+ 8
1858	— 8	+ 8	1858	— 14	+ 5
1859	— 5	+ 7	1859	— 9	+ 7
1860	— 16	+ 3	1860	— 27	+ 4
1861	— 22	+ 5	1861	— 10	+ 7
1862	— 20	+ 4	1862	— 21	+ 4
1863	— 15	+ 8	1863	— 6	+ 8
	MARCH.			APRIL.	
1857	— 11	+ 10	1857	— 6½	+ 14
1858	— 22	+ 12	1858	— 4	+ 17
1859	— 13	+ 8	1859	— 6	+ 16
1860	— 15	+ 7	1860	— 6	+ 13
1861	— 16	+ 8	1861	— 4	+ 17
1862	— 20	+ 6	1862	— 7	+ 17
1863	— 14	+ 10	1863	— 0	+ 11
	MAY.			JUNE.	
1857	— 6	+ 25½	1857	+ 10	+ 26
1858	— 4	+ 20	1858	+ 13	+ 29½
1859	— 2	+ 25	1859	+ 15	+ 28½
1860	— 0	+ 18	1860	+ 8	+ 26
1861	— 3	+ 19	1861	+ 14	+ 27
1862	— 7	+ 22	1862	+ 11	+ 28
1863	— 0	+ 17	1863	+ 13	+ 24.

	JULY.			AUGUST.	
1857	+ 14	+ 23	1857	+ 18	+ 29
1858	+ 15	+ 29	1858	+ 13	+ 27
1859	+ 15	+ 27	1859	+ 15	+ 27
1860	+ 8	+ 27	1860	+ 13	+ 21
1861	+ 14	+ 26½	1861	+ 15	+ 22
1862	+ 9	+ 25	1862	+ 14	+ 23
1863	+ 10	+ 27½	1863	+ 16	+ 24
	SEPTEMBER.			OCTOBER.	
1857	+ 8	+ 21	1857	+ 5	+ 15
1858	+ 13	+ 20	1858	— 4	+ 15
1859	+ 8	+ 20	1859	— 5	+ 15
1860	+ 10	+ 21	1860	— 5	+ 11
1861	+ 5	+ 17	1861	+ 6	+ 15
1862	+ 2	+ 21	1862	+ 1	+ 16
1863	+ 11	+ 18	1863	— 2	+ 15
	NOVEMBER.			DECEMBER.	
1857	— 11	+ 11	1857	— 9	+ 9
1858	— 13	+ 10	1858	— 14	+ 6
1859	— 5	+ 11	1859	— 20	+ 6
1860	— 12	+ 10	1860	— 23	+ 2
1861	— 15	+ 8	1861	— 9	+ 6
1862	— 3	+ 7	1862	— 8	+ 5
1863	— 1	+ 7	1863	— 11	+ 10

In Wermland when the thermometer falls as low as Zero, ahrenheit, I used to fancy it cold, but anything under that nd it rarely exceeds —25° C.), I could very well stand ith a good pea-jacket and gloves. I once felt it as cold as -26° C. in Wermland, but I do not ever remember it older. The winter usually sets in about the beginning of ovember, but we are sure to have frosts and thaws before ie real winter comes on, about Christmas.

The spring is late, and when there is a deep snow it es on the ground in Wermland often till the middle of April.

In the middle of Sweden we may reckon the four winter months to be December, January, February, and March. Spring—April and May. Summer—June, July, August. Autumn—September, October, November.

The winter is certainly a dull, dreary, monotonous season

—eighteen hours dark to six hours daylight, and it is often impossible to get into the forest for weeks on account of the snow, and if you can, there is scarcely anything to shoot. Of all gloomy forests commend me to a northern pine forest late in autumn or winter. Before the frost sets in, these northern forests have a dreadfully aguish feel. Scarcely a bird of any kind is to be seen, and the only sound we hear is the measured fall of the woodman's axe, or the chattering of flocks of crossbills, as they flit from cone to cone in search of food. We hardly ever see a game bird at this season, except it may be a few black cock perched on the highest tops of the birches. All nature out of doors seems to be wrapped in a deep unwaking slumber. The sledging now is often, however, first-rate, and bleak as the prospect may be without, there is nothing cold within doors. Every country house is now thrown open; glad reunions of families and social meetings, of friends celebrate this festive season. The tinkling of the sledge bells ring cheerily through the frosty air, and nowhere are the hospitable rites of old Father Christmas more strictly observed than in these northern climes. The winter is, however, a busy season in the middle and north of Sweden for the forest-owner and farmer, and good sledging at this time is all important to the Swede, who has any timber to get out of his forests or iron ore to transport from the mines. In a snowy winter the tops of the fences are scarcely apparent above the frozen snow. Gates are all thrown off their hinges; high roads are now little heeded, and short cuts are made across the country for sledging over the snow and frozen lakes as straight as the crow can fly.

In 1862 we had a bad winter in Wermland, without any snow (and this is always bad for the rye, but it is worst of all when it snows a little, then thaws and freezes); and in 1863-64 no snow fell till early in February, and our deepest falls of snow were in the middle of March. The new moon in January came in on a Saturday with sharp cold, and as is usually the case here with a Saturday's new moon, the weather was the same for three months. The cold, however, was never very intense, rarely more than

—10°, but now and then in the night the mercury would fall as low as —16° C.

In the middle of February, when we were filling our ice houses, I measured the ice in our lake twenty inches thick, and the frost in the ground on March 10th was nearly two feet. The ice rarely gets much thicker when it is once covered with a pretty deep coating of snow.

The winter landscape in the forest district, especially when seen from a distance, is often very pretty, the dark foliage of the pines standing out in bold relief from the white covering of snow which surrounds them. It is, however, when the beech trees burst suddenly into leaf in the early summer that the beauty of this country is really at its height. I suppose that it is owing to its contrast with the cheerless monotony of the wintry landscape, but it is certain that no one except the man who has passed a winter in the north can form the least idea of the glad and joyous feelings with which summer is hailed by the inhabitants of these northern climes.

Sudden as is the change in autumn, when the biting east wind comes howling over the dreary waste of Siberia, and the landscape is buried beneath the snow drift, it is no less sudden when the mild west wind of May comes with healing on its wings and the summer migrants appear as the glad harbingers of spring. A few dull misty days with warm wind and rain, and the whole face of the country changes as if by magic. The green rye appears as the snow rapidly melts away, the first bea sippa or wood anemone (which is here hailed with as much delight as the little violet at home) raises its innocent head on some sheltered woodland bank. The trees burst suddenly into leaf, and no one who had seen the country a little while before could believe that so much beauty lay hidden beneath the waste of snow. Now all again is activity and bustle out of doors; animal as well as vegetable life all at once wake up from their winter slumber, and for six months the farmer, sportsman, and naturalist have not a day to spare.

When I first see the little white wagtail, I know that spring is not far off, and in the south this is the sign for the farmer to commence ploughing. We are sure, however, to

have a little more winter even after this, but in about a fortnight, when the yellow wagtail arrives and we hear the deep trumpet note of the crane from the wild open mosses, the last struggle between winter and spring is nearly over. Some little time before this I have observed the black-throated diver high in the air flying round and round as if taking a bird's eye view of the country, to see if there is any open water in which he can pitch. Within about ten days from this I am certain the lakes will break up, and it is wonderful when the ice once begins to crack, how soon it altogether disappears. The action of melting has been gradually, but imperceptibly, going on at the bottom, and all at once we see open water at the sides. The ice then suddenly breaks up, and if there should chance to be a little wind, especially from the south, the lakes will soon be all open water. Still I never fancy that spring has really set in till I hear the monotonous flute-like call note of the ortolan bunting from the fence by the green rye. The other spring migrants have often deceived me, the ortolan bunting never.

What an interesting and beautiful study is the migration of the feathered race! The very operations of the husbandman and the sportsman are in a great measure regulated by them, and the more attention we pay to this subject the more regular we shall find their appearance, and many a useful lesson both in the botany as well as the rural economy of a land, may be learned by observing the habits of birds and noticing their migration to and from each particular district.

Man's constant companions in every out-door occupation, cheering him with their plumage and their songs, affording him often a principal means of subsistence, it is little wonder that the study of the feathered race should be a favourite one with all, and to that man whose time is happily and quietly spent in the forest and the fields, it gives one of the finest zests to rural life.

The following table of the arrival of some of our spring migrants into three different latitudes of this continent may not be uninteresting to the naturalist. Of course it only indicates about what time they arrive, and cannot be

depended upon to a day, even to a week, but it gives an idea of what time they generally appear.

	Scania, 55° 50′.	Wermland, 59° 12′.	Norhotten, 66° 25′.
Lark	10th March	11th March	1st April
Golden Plover	22nd „	10th April	6th May
Ring Dove	23rd „	20th „	
Stock Dove	23rd „	25th „	
Kite	23rd „	10th „	
Woodcock	22nd „	20th „	
White Wagtail	1st April	17th „	4th „
Wheatear	7th „	22nd „	15th „
Curlew	10th „	5th May	
Starling	29th Feb.	20th April	
Redstart	22nd April	6th May	
Crane	23rd „	27th April	23rd „
Swallow	3rd May	7th May	10th „
Martin	3rd „	10th „	10th „
Yellow Wagtail	5th „	10th „	30th „
Cuckoo	7th „	18th „	30th „
Shrike	20th „	24th „	
Wryneck	12th „	16th „	
Swift	23rd „	28th „	30th „
Whinchat	7th „	12th „	15th „

The reader, if he chooses, will find a description of a spring and summer in Lapland in my little work bearing that title; and as for the winter there, it would require a much greater share of fortitude than I possess to shut myself up for seven months with nothing to do and nothing to gaze on but a dreary waste of snow, merely to see what a Lapland winter was like. At Vardohuus, the most northerly fortress in the world, hard by the North Cape, the sun never sinks below the horizon from May 21st to the 21st July, and is never seen from the middle of November till the end of January.

In Tornea the longest day is 21½ hours, the shortest but

2½. It does not, however, seem that the cold is so much more intense up at the North Cape than in the forest some degrees further south.

It is curious that, owing to the higher average temperature and greater summer heat than in other lands in corresponding latitudes, many delicate plants will grow in Scandinavia at a parallel where in Asia and America all vegetation ceases.

The oak grows in Norway as far north as 63° along the coast; in Sweden as far on the east coast as Gefle in 61°, but on the west coast not further than 59°.

The oak cannot be called a very common tree here, and only two species are indigenous to Scandinavia—the common oak (*Quercus pedunculata, L.*), and the damask oak (*Q. sessiflora, L.*) This is by far the rarest of the two.

Wheat, cherries, and apples will ripen as far north in Norway as Trondtheim, 63½°; in Sweden, up to Hernosand, 62½°.

The beech grows up in Norway as far north as Laurvig, 59°; in Sweden it ceases at 58°, and it rarely grows at an elevation of more than 600 feet above the sea.

Grapes, mulberries, and walnuts will ripen in fitting localities in the South of Sweden and in Gotland. In the southern Norwegian valleys grapes and almonds have occasionally ripened.

The southern division of Sweden lies in the cold temperate vegetation zone, the northern division in the Subarctic and Polar zone.

The pine flourishes at an elevation of 1400 feet above the sea, and ceases to grow about 2800 below the limit of perpetual snow; and the fir ceases to grow at an elevation of 1000 feet above the sea, and does not flourish higher than 2900 feet below the snow region. Strange to say, at Quickiock, which seems to be a perfect oasis in the Lap desert, both fir and pine grow up the fell sides some hundred feet above the village, which itself lies more than 1000 feet over the sea. The pine limit appears in Sweden to be 59° north lat., but the fir ceases at 58°.

The birch is the most northerly of all our European forest trees. It grows upon the shores of the Frozen Sea. It is the only tree in Greenland and Iceland, and it flourishes in the East, all over Siberia, and even in Kamtschatka. It grows higher up on the fells than any other tree, and in 66° north lat., at an elevation of 2000 feet above the sea. Where no other tree can grow, the birch reaches the height of a man. About 400 feet higher than this, however, some few bushes are met with, and the black stalks of the dwarf birch (*B. Nana*) gradually dwindle to a creeper. The cloud berry ripens at this elevation, but no higher. And the glutton is met with even in these wild districts far higher up than the bear. After this all bushes cease to grow, and the ground is covered only with a brown fell vegetation of lichen and mosses. The only berry that can ripen among the lichen is the crow berry (*Empetrum nigrum*). The Laps never pitch their tents higher than about 800 feet below the perpetual snow region.

To say nothing of the beauty which the clear green leaves in summer and the silvery stem of the birch in winter add to the northern forest landscape, perhaps there is no tree more useful to the inhabitants of the north. For implements, building, and even for furniture, it is greatly in request, and the outer bark, which is easily stripped off in the spring, is used for a variety of purposes, from thatching houses down to soling of shoes. And no sole is so warm, or stands better against the snow, than this. They are called "Näfver," and are sold in little bundles of sixty strips for three rqr. They have one peculiarity—that of never rotting. The birch bark, rolled up, or even oblong pieces of fir bark, are much used here for floating nets instead of corks.

Sallow, willow, and mountain ash, grow freely on both sides of the Tornea River, far within the polar circle. The alder is met with as far north as 63°; the ash up to 62°; elm, hazel, and linden up to 61° north lat.

Oats cease to ripen above 64°; barley ripens as high as 67° north lat.

Of willow the Swedish flora owns at least forty species, twenty of which are peculiar to Lapland, and one, the *Salix polaris*, grows on Spitzberghen. This and the *Salix herbacea* are the smallest plants in the world—perfect trees scarce three inches high. And both grow higher up on the fells than any others.

The Swedish flora owns but two species of heather. The *Erica vulgaris, L.*, the common heather or ling, and the beautiful little cross-leaved heather (*E. tetralix, L.*). The former is much the commonest and is met with everywhere, marking the place where the pine-forest formerly flourished. In the olden time, forests of fir and pine, covered all the wide sandy spots where nothing else would grow in the north. These forests were burnt up in the wars which in the olden time were continually raging among the savage inhabitants of this land, and such as escaped the fire have since suffered more severely by the axe and the necessities of man. The forests have gradually disappeared, and nothing remains in their place save wide-stretched "heaths" or "hedas" of no service to any one. I never saw either the broom or gorse in Sweden.

The following table shows the order in which the commoner Swedish trees come into bloom and leaf:—

1. The order of blooming of those trees which bloom before the leaves shoot—

1. Hazle	Hasseln
2. Alder	Alen
3. Elm	Alm
4. Sallow	Salg
5. Several species of Willow	Pil
6. Swedish Maple . .	Lön.

2. The order in which the different trees appear in leaf:—

1. Gooseberry (Krushär) at the same time as the Elm blooms

2.	Red Currant	Vinhär
3.	Bird Cherry	Hägg
4.	Elder	Fläder
5.	Mountain Ash	Rönn
6.	White Willow	Hvit Pil
7.	Alder	Al
8.	Apple tree	Äpple träd
9.	Cherry	Körshar
10.	Guelder Rose	Olvon
11.	Birch	Björk
12.	Hazel	Hassel
13.	Elm	Alm
14.	Hedgerow	Njupon Busk
15.	Pear	Päron Träd
16.	Plum	Plommon
17.	Buckthorn	Werrentorn
18.	Alder Buckthorn	Bräkned
19.	Lime	Lind
20.	Beech	Bök
21.	Service	Oxel
22.	Trembling Poplar	Asp
23.	Maple	Lönn
24.	Oak	Ek
25.	Ash	Ask.

The blooming of the hazel is the first appearance of vegetable life among trees, and the shooting of the leaves of the ash the last. With the first we may reckon the commencement of the Northern spring, with the latter its conclusion.

After a careful comparison of five years, Bishop Agardth gives the following as the medium time of the leafing, flowering, and shedding of the leaves of the following trees in Wermland:—

	Leafing.	Flowering.	Shedding.
Gooseberry	14th April	4th April	28th Oct.
Sycamore	18th „	25th „	2nd „
Mountain Ash	18th „	28th „	16th „

	Leafing.	Flowering.	Shedding.
Bird Cherry .	18th April	14th May	10th Oct.
Lilac . .	18th „	15th „	20th „
Raspberry .	18th „	16th „	4th Nov.
Birch . .	20th „	15th „	8th Oct.
Horse Chestnut	23rd „	26th „	19th „
Apple . .	23rd „	28th „	26th „
Aspen . .	26th „	5th „	24th „
Lime . .	10th May	18th July	20th „
Elm . . .	15th „	20th April	20th „
Ash . . .	20th April	10th May	20th „
Pine . .		1st July	
Fir . . .		1st June	
Juniper . .		10th „	

The vegetation of the Scandinavian fells, according to Thomee, may be divided into the following regions:—

1. *The Cereal Region.*—On the west side to 1400 feet elevation; on the east side, 2200 feet.

2. *The Forest Region.*—On the west side to 2100 feet; on the east to 2700 feet.

3. *The Birch Region.*—On the west side to 3100 feet; on the east side 3500 feet.

4. *The Dwarf Birch Region.*—On the west side, 4800 feet; on the east side, 5200 feet.

The climate on the Norwegian or west side of the fell range, owing to the proximity of the sea, is milder than on the east or Swedish side.

According to Meutzer, the limit of perpetual snow in different latitudes may be taken as follows on the Scandinavian fell range:—

	Swedish or East Side. Feet above the Sea Level.	Norwegian or West Side. Feet above the Sea Level.
Under 59° N. Lat.	6000	
„ 60° „	5900	5800
„ 61° „	5800	5600

	Swedish or East Side. Feet above the Sea Level.	Norwegian or West Side. Feet above the Sea Level
Under 62° N. Lat.	on the Dovre Fell	5300
„ 63° 30′ „	5200	
„ 64° „		4800
„ 65° „	4300	4500
„ 66° „	4600	
„ 67° „	4400	on the fells 3900; in the valleys 3400
„ 68° „	4100	3400
„ 70° „	up at Alten	3600
„ 71° „	at the North Cape	2400

Horses are not met with above 67°. Meutzer gives the most northerly limit of the glutton and the lemming 70°. The bear, wolf, lynx, otter, beaver, fox, martin, weasel, squirrel, between 69° and 70°. Of the hare and stoat at 69°; tame rein-deer 69°. Anywhere above the polar circle the midsummer sun is to be seen above the horizon during the whole night, but just within its limits it is necessary to ascend an eminence to see it well. The southern limit of the tame reindeer in Sweden is 64°, which now appears to be the most northerly limit of the elk, but wild reindeer are met with on the Norwegian fells nearly as low as 60°.

The whole of the Scandinavian continent lies upon a mass of rock, the sharp and barren fragments of which after having been pulverized by time, lie scattered all over the lower valleys and plains, covered over only in certain places with a thin layer of earth or vegetation, so that the moderate harvests of these northerly countries demand greater care and labour than in other lands more favoured by nature and climate. In the Scandinavian rocks and mountains those formations which are peculiar to certain other lands, containing coal and other valuable products and minerals, are wanting, and only in one place, Höganœs, in South Sweden, is there a bed of coal, and this of very moderate extent. In Sweden we certainly do meet with mountains

piled in horizontal strata and layers, for example, Kinne Kulle, Gotland, and Aland, but these are all of the primary formation, and own none of the newer geological or vegetable productions. The principal ingredient of these Scandinavian horizontal strata is chalk, and as chalk has a great influence on vegetation, the tracts which lie in the vicinity of these chalk formations are most fruitful and rich in vegetable products. The land is, moreover, in many places scattered over with erratic blocks of stone, a memento of the glacial period which these countries have passed through in earlier ages; and it is a wonderful fact, probably owing to volcanic agency, which is still at work, that the water is by degrees receding from some part of these coasts, and the land gradually rising, which on the shores of the Bothnia is computed at four feet in every hundred years. This receding of the water gradually, however, diminishes along this coast until we reach Skane, where it is no longer apparent, but is again visible in Halland and Bohus Land. In the south of Norway, it is computed that the land rises ten feet in every hundred years. But it is a singular fact that in Skane, instead of the land rising, a directly opposite phenomenon is taking place, and on the coast around Trelleborg the water is gradually encroaching upon the land. In 1749, Linnæus measured the distance here from the water's edge to the "Stafsten" (a large stone set up a little west of Trelleborg), and found it to be 357 Swedish ells, and in 1847, Professor Nilsson measured the same distance, and found it to be only 160 ells, so that in ninety-eight years the sea had encroached upon this coast 197 ells, or about four feet every year.

Nilsson, in an excellent article on the geology of Sweden, comes to the conclusion that in earlier ages the Baltic was all dry land, and Sweden was land-locked with the north of Germany. This seems very probable from the fact of banks which now lie far out in the sea at a depth of twenty to twenty-six feet below the surface of the water being completely composed of land and fresh water deposits. The Baltic, which is surrounded by land on nearly all sides, and has its

outlet to the North Sea only through the three belts, can scarcely be regarded as anything more than a large fresh-water lake. Its depth varies considerably, nowhere, however, exceeding 145 fathoms, in many places not fifty. On account of the fresh water which 253 rivers pour into it, the water of the Baltic is one-fifth less salt than that of the Atlantic, and there are no tides.

After some excellent remarks on the geology of the land and the formation of the Scandinavian fells (which I much wish I had space enough to insert fully), he concludes thus—"If we now consider that the medium limit of perpetual snow over Scandinavia between 60° and 70° north latitude is not more than about 4500 feet above the level of the sea; that the medium height of the Scandinavian fell range (of which many square miles even now lie within the perpetual snow region) is about 4000 feet; and that about one-fourth of the whole Scandinavian continent lies 3000 feet above the level of the sea, and consequently not more than 1500 feet below the limit of perpetual snow; so it will be easy to guess what will be the result, if this gradual rising of the land progresses yearly after the same rate as at the present day. We can, then, easily reckon (if we take into consideration how much the land has risen within a given period) how many thousand years will elapse before the whole of Scandinavia is again covered with glaciers, in case this elevation of the land still goes on."

This is certainly a most interesting subject to the geologist; but as it is pretty certain that the country will remain much in its present state, at least, till a reprint of this book is called for, I think I may venture to go on with my task.

METALS AND MINERALS.

Gold is found in Sweden, but in very small quantities. They are now turning their attention to the gold, which is found mixed with the copper in the Falun mines, and I believe the yearly return is something like 100 lb.

Silver is found in Sala mine in Westmanland and

Ridarehytta in Orebro Land, which in 1861 gave a return of about 2207 lb. Kongsberg, in Norway, is, I believe, one of the richest silver mines in Europe.

Iron, however, forms the principal mineral wealth of this country, and the richest iron mines which are being worked lie in Wermland, Westmanland, Dalarne, and Upland. The yearly produce of the iron mines is on the increase, and in 1861, according to Malmström, was computed as follows:—

Pig Iron (Tack Iern), 3,885,000 cwt.
Wrought Iron (Stang Iern), 3,408,000 cwt.
Manufactured Iron and Steel, 593,000 cwt.

The price of iron for the year is settled among the great mine owners at the winter markets; and in 1864 the price of pig or cast iron was fixed at 3 rqr. 50 ö. (above 3s. 10d.) per cwt., free on board at Arboga, a little north of Carlstad. The ordinary price of wrought iron here is about 7s. per cwt. In 1855 the produce of the iron mines in Great Britain was thirty-five times richer than those of Sweden. The value of the Swedish iron seems within the late years to have fallen; and in 1860 Swedish iron was quoted in London at £10 10s. per English ton, but still 1s. 3d. higher than English iron.

Sweden is very rich in iron ore, but unfortunately much of it lies in districts which cannot be worked for want of communication. Up at Gellivare, in Lulea Lapland, there is a very rich iron field, and much of the ore lies on the surface of the ground. As this name is well known, a short account of the great Gellivare iron mines may not be uninteresting to the English reader. It can hardly be called a mine, but a mountain of malm-rock, lying above the surface of the ground. In 1819 it gave a return of 9000 skeppund of ore (one skeppund in the old weight was equal to 400 Swedish pounds); in 1839 it rose to 17,398 skeppund, but in 1849 the return was only 6223 skeppund; 1859, 3200 skeppund; and in 1860, only 450 skeppund.

This mountain was first discovered in 1730. It was first worked in 1736 by a Captain Tingnall, but little was done

on account of the cost of transporting the ore on reindeer to Strömsund's iron furnace. About the end of 1790 the mountain was purchased by an iron founder named Hermelin. In the neighbourhood there were many localities fitting for the erection of furnaces and forge hammers; for instance, Wassero An, half a Swedish mile from Gellivare, Wuosko Backen, and Nattavara, five Swedish miles from Gellivare. Hermelin did not avail himself of any of these, but endeavoured to transport all his ore down to the furnaces on the coast of the Bothnia; but want of labour and expense of transport beat him.

In 1800 the Swedish Government took the affair in hand, and in 1817 a committee was appointed to examine and report on the best means of transporting the rich ore, which is to be found not only in Gellivare, but also in Afner Kalix and Jukkasjarvi, and they made their report in 1818. They proposed to join the rivers Lina, Angesa, and Kalix through a line of canals; and thus transport the ore down on a large scale. I may add, that Gellivare lies within a short distance of the river Lina, in about 67° north lat., and about 200 miles to the east of Neder Kalix on the Bothnia. Other engineers approved of this plan of forming canals, but they suggested that furnaces should be built and the ore smelted in the neighbourhood. In 1827 Herr von Scheelé, a man of great practical ability in the affairs of mines, surveyed the spot, and proposed to lay a railway from Gellivare to Storbäcken, on the great Lulea river, and then transport the ore by water down to Lulea; and when I was up in Lapland in 1862, this appeared to me to be the most feasible plan.

The decrease of the ore is owing entirely to the increased cost of transport. During the last, and early in the present century, the Laps only received for transporting the ore on their reindeer twelve Swedish miles (or nearly eighty English), to Edefors and Spiken, from which places the ore was carried to the furnace, 30 lb. of flour, or one-half a species dollar (2 rqr.) per skeppund. In 1836 one skeppund (400 lb.) of Gellivare iron ore cost about two and a half, but

afterwards three and a half rqr. bco. (or about 5s. 6d.), although the cost of smelting was not 6d.

Gellivare mountain, with all its appurtenances, was sold by Hermelin to King Carl Johan, and in 1856 was sold by King Oscar to a Swedish and Norwegian company. In 1857 it was proposed to lay a line of railway, sixteen and a half Swedish miles long, at a cost of five million rqr., nearly in a straight line from Gellivare to Strömsund's harbour in the Bothnia. To aid this project, Government offered the land and wood free, a toll-free import of all required material, and a toll-free export of 150,000 skeppund of ore; but the railway was never begun, and the company sold the whole concern to some Gothenburg merchants in 1860. The estate covers altogether an area of 80,000 tunnland; and this domain, so rich in iron ore, still remains of very little real value to any one, compared to what it might become if a sufficient capital was brought to bear in working the mines properly.

Dr. Clarke in 1824, in describing this mountain, says:— "Gellivare is the largest iron mine in Sweden, and perhaps in the whole world. Its layer of ore extends for several miles, and is so rich that it leaves 60 per cent. of iron."

An English engineer, Mr. Thomas, who inspected it in 1857, declared "that through a systematic manner of working it, and with an easy accessible shaft, and without any pump apparatus, seven to eight million tons of pure magnetic iron ore could be easily obtained."

It is difficult to say what might be the produce of this immense iron field, as they have only as yet taken the upper layer, and never sunk to any depth; but the committee which visited it in 1817 reported that though this mountain, which they found to consist of two ridges, the one about 18,000 and the other about 10,000 feet in length, could not be called a mass of ore, it might nevertheless be properly called a mountain of iron ore in which the ore did not lie in veins and cavities only, but appeared regularly spread over a surface of fourteen million square Swedish

yards. Consequently, if the whole mass of the mountain were pure iron ore, this surface, if it were sunk only to the depth of one fathom, would yield a produce of iron ore equal to about three hundred million skeppund, or thirty-seven million English tons.

According to Government returns in 1858, the ore in the Norra Iron Mine yields 50 per cent., but that of Gellivare 67 per cent.

I am the more induced to make a few remarks on this subject, as it is in the contemplation of the Swedish merchants who now own this mine, to form a company, in which they wish the English to join, for working it; the advertisement of which I copy from the Stockholm "Afton Bladez" of March 8th, 1864, and which has also appeared in the English papers.

"The Gellivare Company, Limited, formed in 1862, capital £500,000 in 10,000 shares of £50 each.

"The Estate covers an area of 1,200,000 acres, of which 500,000 consists of pine forests, and 100,000 are adapted to agriculture.

"1. The Iron Mine itself described according to Edman's survey in 1862.

"2. 215 settlers' residences for the workmen, 9 water and 1 steam saw mill, 2 furnaces and 4 forges.

"3. The timber gives a great yearly result. The yearly produce is reckoned at above 10,000 St. Petersburgh standard or 33,000 loads, which if sold for £4 5s. per standard free on board, would yield a clear gain of £1 5s. per standard.

"The malm can be worked cheap, on account of the great produce of charcoal, so that 25,000 tons of pig iron can be easily worked at a cost of £1 19s. per ton free on board, of which the shipping price is about £4 per ton.

"A line of railway is proposed from the Mountain to the Lulea River, about sixty English miles, and then by two short canals over two waterfalls, the transport will be right down to Gaddoit Harbour in the Bothnia. The total cost of this railway and canals would not exceed £232,000.

"It is proposed that the company shall give £225,000 for the estate, and with the cost of railway, will require a capital of £500,000.

"The yearly produce is reckoned at the prices of foregoing years thus:—

60,000 tons of Iron Ore to furnaces in Sweden and Finland at 6s. per ton	£18,000
To the working of 25,000 tons in the company's own furnaces, at a profit of £2 1s. per ton. . .	57,250

To 15,000 standard of timber, at a profit of £1 5s. per standard	18,750
Profit on the Railway	8,700
On the canals	6,395
	£103,095
Deduct for Expenses.	8,095
Leaving a yearly income of	£95,000

or 19 per cent on the capital with a probable rise in the quantity of ore, and the probability of working bar iron and steel.

"The yearly interest of 6 per cent. for the first three years is guaranteed to the shareholders on their money invested, by a deposit of £50,000 in the hands of the company."

Now this all looks well enough on paper, and seems to offer a very good return for the capital invested. As to the last paragraph of guaranteeing 6 per cent. for the first three years; it appears to me to be much about the same as if I borrow £75 from a man and give him *my bill* for £100 with which to pay him the interest.

I have talked this speculation over with many men, competent judges, and I never heard but one opinion, which is, that the iron ore in this immense field (we can hardly call it a mine) is nearly inexhaustible, and that it is richer than that of any other mine in Sweden. Yet some how or other, I do not see that any one here appears very anxious to enter into the scheme. The probability of getting nineteen per cent. for their money, would, I am certain, in any ordinary speculation, tempt the Swedes, and although not a rich country, there are many rich iron masters, and merchants with good capital at command. It seems, however, that the whole dependence of the promoters of the speculation is on the support of the English, and if half the shares were taken by Swedes, I do not think there would be much hesitation in English capitalists investing, for I feel certain in my mind that if the project is well managed, and properly carried out, it will be a paying speculation. I do not look so much to the timber, for I heard a very different account of this when I was up at Quickiock, in 1862. I do not suppose that there will be any further difficulties

in the matter of transport than capital and good engineers will be able to surmount. But I cannot see where hands are to be got to work the affair on a large scale, unless the English follow the example of their Russian *friends*, and turn Lapland into a second Siberia by sending out the convicts to work in the Gellivare mines. I know labour is so scarce up there, that the owners of the mines have used all inducements for settlers to come up and work. A grant of land was offered to each to farm, but I believe he had to build his own log hut on it. A few did come up, and bitterly I heard some of them complaining that they ever left their homes in the more southern parts of Sweden to settle in this wilderness. It is simply absurd to talk about agriculture in a district where I do not suppose, on an average, they will get their crops to ripen more than once in three years, and where a potato two inches long would gain a prize if there were any agricultural meetings. The Laps, I apprehend, would not be of much use, for like other wild men, they are too fond of a roving life ever to settle down to steady hard work. I have not much experience in mining, but I suppose very little could be done in the winter, and if men have to be brought up in the summer to work for a few months, and sent back in the winter, it would be a very costly affair. A good many public works are now being carried on in Sweden, such as railways, etc. I do not know whether they have any difficulty in procuring hands, but I know that in Wermland, farm labour is now very scarce, so many men being employed on the railways, and it is wonderful how low the supply of labour is becoming during the summer months in the midland districts. Still, I suppose, this is to be managed, and if I saw that half the shares, at least, were taken up by the Swedes and the Norwegians, I should begin to think that business was meant.

The great mine of Danemora gives also a considerable yield of iron, in 1860, 131,001 skeppund, and this is of the finest quality, for when the price of ordinary Swedish iron in England was £10 and £11, the "Oregrund" or Danemora iron fetched as high as £22 to £32 per ton.

The Swedish steel is, perhaps, the best in the world, and some say that this is owing to the ore being smelted by charcoal instead of coal.

The greatest export of Swedish iron to England ever known was in 1860, and next to that in 1857, when 314,352 skeppund, or nearly 40,000 tons were exported; but a great deal of it comes back again into the country as manufactured goods, for in 1860, 2,191 cwt. of steel, besides a considerable quantity of iron goods of every description, were imported. There are, however, several manufactories of steel and iron; and agricultural implements are now made so good and cheap in Sweden after English models, that it will hardly pay to import them from England.

The export of wrought iron from Sweden in 1863, was 3,153,674 cwt., and of steel, 63,268 cwt.

Besides the above named, there are other metals and minerals in the country, at present only obtained in small quantities, but which will doubtless increase as the resources of the country open out, and better communication is attained; such as lead, sulphur, litharge, vitriol, alum, and a yearly produce of coal in the south of Sweden, amounting to about 140,000 barrels.

The exports of all other metals in 1863, besides iron and steel, was 3,163,674 cwt.

The manufactories of glass, porcelain, paper, etc., are yearly on the increase.

THE FORESTS.

We now come, however, to the loadstone of Swedish wealth; and certain it is that from great mismanagement this sound and standard source of inland riches to the country is gradually decreasing. It is as far beyond my capacity as it is out of my province to endeavour to point out a remedy for the defects of a system about the working of which I know little or nothing; but it requires no great amount of observation in a man whose out-door

occupations lead him much into the Swedish forests to see the wretched state in which most of them are kept, and the waste of timber that really takes place. Let no man at the present day expect to wander among the primeval forests of the north. The axe has done its work too effectually; and rotten stumps, in many places four feet high, are all that now mark the spot where the giants of the forest once stood. It is rare to see a tree, at least in any ordinary forest within reach of a large river, above fifty years old; and even these are fast sharing the fate of their older brethren. Moreover, the ground is everywhere strewed with fallen trees, which lie rotting in the wind and sun, of no use to any one. On all sides the work of devastation is apparent. In very few cases do we see any care bestowed upon the forest culture.

The present system of mismanagement in the northern forest is indeed an apt illustration of the fable of the farmer who killed the goose which laid the golden eggs; with this part of the subject, I have, however, little to do. Any one who is interested will find it ably treated of in Bishop Agardth's masterly work on Swedish statistics, to which I am indebted for much information contained in this chapter. My business is merely to lay before the English reader a short statement of the economy of the Swedish forests, their extent, their produce, their capabilities, and their present mode of management.

As I have before shown, the pine and the fir are the most valuable products of the Swedish forests. Not that the birch is perhaps less valuable, but it is not so extensively grown. In commerce the timber of the pine may be reckoned as worth 25 per cent. more than that of the fir. The roots of the pine go much deeper into the earth than those of the fir, which are often spread on all sides around the tree above the surface of the ground; and therefore in these forests we see that the fir grows chiefly in such places as are strewed with large blocks of stone, among the cracks of which the roots can creep. On the contrary, the pine thrives best in those places covered with sand and small

stones, where the roots can strike deeper. The fir also requires a richer and better soil than the pine. Besides the fir, the aspen, or trembling poplar, is scattered over all the lower grounds and grows to a great size in many places. It is one of the commonest trees in Sweden, and appears to grow in any soil from the very fell sides downward. It is a quick growing tree, and in thirty years has attained a large size. It appears to be little valued, except that the wood is much used in the manufacture of lucifer matches, and the leaves and branches, like those of the birch, are gathered in the autumn, and used as winter food for sheep. This is the only species of poplar, indigenous to Sweden.

The mountain ash also in many places attains a large size, and its bright red berries partly serve to dispel the gloom of the wintry landscape; and as here we have no hawthorn, and the few hips of the wild dog rose are plucked and sold for preserving, the berries of the mountain ash and the juniper, which grow freely, at least in all Wermland, form the principal subsistence of most of the small birds that remain in Sweden during the winter. But these can scarcely be called forest trees. There is another tree, however—the birch—which appears to be the peculiar companion of the fir, and is about the only one that will thrive in its company, and immediately the fir forests disappear the birch takes their place.

No tree is so valuable in the young fir plantings as the birch, for it is of quick growth and serves to shield and foster the more valuable trees that grow in the same forest. At the age of ten years the birch is hard enough for firewood, and no forest tree answers so well for this purpose, containing as it does so much heat. At thirty years it can be cut down as underwood, and at fifty years it has attained its full growth. As the birch trees are cut down the more valuable trees are left. The birch thus pays for planting and preserving the better trees which fatten the land, while the birch, when planted alone, impoverishes it.

As Agardth sensibly observes:—"When we see so simple and cheap a method as this of providing our wood, first for burning and afterwards for timber, it does, indeed, appear singular that in our land we are complaining on all sides of the prevailing want of timber, without having resource to so easy a remedy. We complain, but at the same time stand by with folded arms."

The pine requires more air and light than the fir; consequently, if the trees stand close together the stem is always free from branches, which then, as it were, form a crown on the top. The pine reaches a greater age than the fir, and comes to maturity later, the further north it grows. In Wermland they are full-grown at the age of 180 years: in Dalaroe at 210; but in more northerly tracts not until they are at least 300 years. This we must bear in mind; for when we are treating of the management of the forests by a proper circulation it is the basis upon which our calculations are grounded; we may, however, here state that when we allude to 100 years' circulation, we do not mean that the tree is *full-grown* at the age of 100 years, but only that it is then of a sufficient size to be cut down for saw blocks. Probably 120 years' circulation would be nearer the mark south of Stockholm; but not in the north. For all our purposes, however, a circulation of 100 years will suffice.

For fire-wood the pine is much better than the fir, as it burns much brighter, and leaves a better coal. For good fire-wood the tree should be cut down in the winter when all the sap is in the stem, split up in the spring, dried in the summer, and brought home for burning in the following autumn.

It appears hardly yet to have been ascertained with any degree of certainty how much the thickness of the tree at its root and a greater distance up the stem betokens its age, but the following calculations are, I believe in the main, correct:—

A pine up the Tornea River under 66° 40′ north lat. with a diameter of 9½ inches is about 100 years old; 11 inches,

150 years old; 13⅞ inches, 200 years old. So according to these proportions it appears that in this latitude a pine grows one inch in diameter in every ten years during the first century; but in the second century only one inch in every twenty-two years. At Gefle, under 60° 4′ north lat., a pine of 14 inches diameter is about 100 years old; 18½ inches, 150; 21¾ inches, 200. It will be seen how much quicker the tree grows in a more southerly latitude.

In 67° north lat., on sandy ground, it takes 300 years to get a good block of fir of sixteen inches diameter; but it has then long since passed its best point of growth.

In the middle of Sweden, latitude 59° 20′, it is reckoned a fair growth if ten rings in the timber give one inch breadth of wood on each side of the pith, (*i. e.*, two inches for the diameter or thickness of the tree) and one foot in height. A tree of 100 years old of such a growth will be twenty inches in diameter at the root, and 100 feet high to the top. At twenty feet from the ground the stem will be fifteen to sixteen inches in diameter, and, consequently, fit for a saw block. At thirty feet from the ground the stem will be twelve to fourteen inches in diameter.

"It was easy enough," as Bishop Agardth observes, "in the olden time, to distinguish in the northern forests the difference between the trees fit for masts, for saw blocks, and for building purposes. Masts are now no longer found in any forests which are of service to man. Those forests in which saw blocks are to be found, are gradually reduced to smaller and smaller dimensions, and by degrees we shall have no timber left, except just for building purposes. At length we shall only find trees for charcoal and firewood, and in the end we shall come only to wood rubbish."

The following table of the thickness and height of trees in Wermland, 59° 46′ north latitude, may be taken as pretty correct:—

			in.				ft.	in.
Pine, 8 years old, will be			1½	diameter at the root;		length	5	3
10	„	„	3	„	„	„	8	0
12	„	„	4	„	„	„	11	8

At 20 to 40 years old, we may reckon 5 to 7 yearly rings to the inch. After that, 10 to 13 yearly rings to the inch. A tree of 100 to 150 years of age is twenty to twenty-four inches in diameter at the height of a man's breast.

			in.			ft.	in.
Fir, 11 years old,			1¼	bottom diameter;	length	5	3
17	„		3	„	„	10	10

On Asplund, Wermland, where this calculation was made, there was a young pine wood, about forty-five years old. The trees were very regular, forty-five feet in height, and seven to eight inches in diameter.

The age at which both the fir and pine, bear cones, depends much upon whether they stand close together or apart from each other. Where the trees stand well apart, free to the wind and sun, they will bear fruit at twenty or thirty years of age, but if they grow close together, not before they are seventy years old. But it is not every year that they flower; on an average, perhaps, not more than every eighth or tenth year. According to Wallenberg, the fruit of the pine does not ripen until the third year after blooming. It is reckoned that on a Swedish tunnland there is room for 300 trees of 100 feet each.

I had an opportunity this spring of spending a week in the forest with a friend near here (to whom I am yearly indebted for a little elk shooting), and seeing the process of timber floating down from the woods, about six miles to his saw-mills. I had a good deal of chat with him on the subject of the forests. Like every other Swede whom I ever met, he willingly and most kindly gave me all the information in his power, and I was glad to find that his remarks corroborated, in a great measure, all that I have written on this subject. His forests extend over more than

10,000 acres. He manages them properly and they are about on a par with the best round here. He says, by managing these forests properly, he can cut down yearly 400 dozen of sawing blocks. Many trees will cut into two blocks; these blocks after cutting, as they lie in the forest, are scarcely worth £1 a dozen. But when he has sawed them (each tree will average three planks) they, of course, will be worth more, and he may, probably, clear 15s. a dozen, after all expenses are paid, when they are sold in Gothenburg. It is very hard to give an estimate of the value of forest land to purchase. Everything depends upon its situation, as much of the forest lies so far from water communication, that it can never be of use to any one. However, he says, take all Wermland through, the forest land will not be worth, on an average, more than £1 per acre to purchase.

	Swedish square miles.	
According to Bishop Agardth, the total area of Sweden is		3868
From this deduct—		
Inland lakes and mosses	498	
Arable land, meadows, and other enclosed ground	247	
For fells and forests in the northern provinces, not available, and for barren flats in the south	1500	
	——	2245
We shall find an area of forest land throughout the whole country left of . . .		1623
But from this we must deduct, for swamps and rocky lands in the forest, where no trees can grow		500
Leaving an area of productive forest of . . .		1123

Or equal to 26,000,000 Swedish tunnland; or above 31,000,000 English acres.

The crown, or royal forests, in Sweden are sixty-six in number, lying in ten provinces, and extending over an area of 143,224 tunnland.

On a fair calculation it is reckoned that, at the present day, the timber which can be put to any profitable purpose in these forests, does not exceed more than twenty-two fathoms of 100 cubic feet on each tunnland, so that, according to Herr Ström, the gross produce of the 26,000,000 tunnland will be 572,000,000 fathoms, which if we allow for the 100 years' circulation (as noticed hereafter) will give us a yearly return of 5,720,000 fathoms, or one-hundredth part of the gross return of 572,000,000 fathoms.

Now, according to Ström, the consumption of wood in Sweden in the year 1854 was

	Fathoms.
Calculated at	6,915,568
And the export	436,169
Total	7,351,737

The yearly consumption he reckons thus :—

	Fathoms.
For firewood—one fathom for each person .	3,600,000
(This was some years back, when the population was not so numerous.)	
Charcoal for Furnaces, etc. (it is reckoned that seven cubic feet of wood go to each tunna of charcoal)	1,986,000
For Brandy Distilling (six fathoms for every 1000 kanna, and, according to Herr Nycander's report, 11,678,000 kanna were distilled in 1854—but in 1862 14,376,000 kanna were distilled)	70,068
For Burning Bricks and Tiles (one fathom to every 1000 bricks)	12,500

	Fathoms.	Fathoms.
Steamboats	20,000	
Steam machinery on land . .	15,000	
Glass and porcelain manufactures .	12,000	
		47,000
Timber used in building houses, ships, carpentering, etc.		1,000,000
Total . . .		6,715,568
Exports in 1854		436,169
Total consumption .		7,351,737

But there appears to be a mistake in the adding up of Ström's calculation. The sum total should be 7,151,737 instead of 7,351,737, as he makes it; but I will follow his calculation, and allow the consumption to be 7,351,737, for it has of course much increased since 1854.

Now allowing the yearly consumption to be 7,351,737 fathoms

And the yearly produce of the forests, if fairly managed, to be . . .	5,720,000	,,
We shall find that there is a dead yearly loss on the capital of the forests of .	1,631,737	,,

In remarking on Herr Ström's calculations (with which although not altogether agreeing, he considers in the main to be pretty correct), Bishop Agardth observes—

"The above calculation plainly shows that, as the yearly consumption of timber is greater than the yearly produce (at least what ought to be the produce of the forest if it was properly managed) a time must come at last when the forest capital will altogether cease; that is, when the woods have totally disappeared. They resemble a great capitalist, whose yearly expenses exceed his yearly income, and consequently all of a sudden he finds himself a bankrupt.

"Herr Ström has presupposed a hundred years' circulation in the cutting down of the forest; we must, therefore,

reckon the interest, or yearly revenue, as one per cent.; and, on the other hand, we find that the yearly consumption or expenditure is one-twenty-eighth, or one and a quarter per cent., according to which reckoning the whole of the forest capital will have disappeared in 350 years from the present time. If this, however, were the case, we could hardly say that the prospect for the future was so dark, because for the next three centuries we might manage our forests after a better plan.

"But this result, *i.e.*, the disappearance of the forests, must come much quicker, when we take into consideration that the population of Sweden increases after the rate of one per cent. per annum, and therefore that the annual consumption of wood will also increase in a like ratio (one per cent.); so that the forest capital will yearly decrease much more than one and a quarter per cent.

"In seventy years the population of Sweden will be seven millions, consequently the yearly consumption must be assumed as if the seventy years were double, or above fourteen millions of fathoms; whence it follows that the Swedish forests will have totally disappeared not in 350, but in 120 or 130 years."

We have above alluded to the hundred years' circulation in these forests, and I will now explain how they should be properly managed, that the owner might be able to obtain a yearly supply of wood and yet leave a sufficient stock in his forests for a future day. A fir tree grows one foot a year, and has arrived at a good timber growth say in a hundred years. This varies, as we have before shown, in different latitudes; but this circulation is near enough for our present purpose.

Supposing a man to purchase say 1000 acres of forest, and in its present state there will probably not be a tree of forty years' growth standing on it, but still on every acre some timber trees, although small, besides small wood. He divides this forest into a hundred parts, and clears off ten acres, or one-hundredth part, every year, cutting down every tree, great and small; for the principal thing to be regarded in forest culture is, that the trees all grow pretty

equally of the same height, and not that one should overshadow the others. As soon as this ten acres is cleared, he sows it with new seed of fir and pine mixed, at an expense of about 2s. 6d. per acre.

The next year he clears off another hundredth part, or ten acres, sows it in like manner, and so on year after year.

In ten years' time he goes back to his first ten acres to clear them out. The young trees which he thins out will be by this time about ten feet high, and will serve for pit props and other small poles.

In ten years he will thus have twenty acres of productive forest—his ten acres of old wood which he clears off, and the ten acres of young wood which he thins out. His older timber is yearly increasing in value, and as he can clear his young plantings every tenth year, in twenty years he has ten acres of old forest to cut down, ten acres of twenty years' growth to thin out, and ten acres of ten years', and so he goes on. His forests are yearly increasing in value, and although he may not live to reap the full benefit of this proper mode of management, he is sure to leave behind him a valuable heir-loom to his family, for think what would be the value of these forests if they were thus managed! Unfortunately, however, this requires time, as the forest will not give a return for the capital laid out upon it in the first year's crop, like a plough-field, and as long as the ready penny is looked after so much more than the slow shilling, and men are either unable or unwilling to invest their capital in a safe but slow speculation, it is hardly likely that this proper system will be introduced into the management of the Swedish forests. What a country Sweden would then be in a hundred years hence! This time must assuredly come, although we may not live to see it. It is the want of proper management that ruins these forests, quite as much as the axe.

As Agardth properly observes, "If Sweden could only arrive at such a position, that our landed proprietors would no longer consider the land they hold as simple goods and chattels, or a mere matter of merchandise which they are

ready to part with at a moment's notice (a circumstance owing to the fact of the heavy mortgage debts which encumber our land), but would consider their estates as a home for themselves, their children, and their children's children; then it is not only possible, but certain, that a proper attention would be paid to the culture of our forests. For experience has sufficiently proved that this very circumstance of regarding estates in the mere light of marketable chattels, has been the greatest cause of destroying the private woods in Sweden."

But after all, private forests are only capital, which the holder has a right to make the most of, and it is a question with a man, when he invests his capital in the purchase of a forest, which will give him the best return for that capital, to let it lie in the forest under a hundred years' circulation, or whether he cuts down all his forest at once, and invests the produce of the timber at interest in other ways.

According to Agardth, if the forest is divided into 120 years' circulation, it gives one-one-hundred-and-twentieth income every year, or five-sixths per cent., and when we take from that the rent on the capital which is required to carry out the system, it will perhaps hardly give two-thirds per cent. This is little more than what a common meadow will return.

Still it appears to me that if I chose to cut down all my forests, common prudence would dictate the expediency of planting them again, as the forest land will be fit for little else. Moreover, in every forest there must be many trees not worth cutting down, and if these were allowed to stand, they would soon double their value, for at this very time, if a tree in the Wermland forests of twenty years' growth (twenty feet long), which measures ten inches across the little end, is allowed to stand ten years longer, its value will be double what it is now. In fact, no prudent forest owner would ever fell a tree until it measured twelve inches across the small end.

But it seems that the mismanagement of the forests in many instances proceeds as much from laziness as from care-

lessness; for I recollect in January, 1863, a tremendous storm swept over South Wermland from the west, and thousands of trees were blown down in the forests just round us. Every one was complaining of the damage which the forests sustained, and this was about all that many of them did. Had these trees been collected, lopped, topped, and barked—even if they had laid in the forests until they could have been driven out, they would have been worth something, but there in many forests these trees lie now just as they fell, with the bark on, rotting as fast as they can, and there they seem likely to lie, and there is no telling what damage they may do to the growing forests by affording such a convenient harbour for every insect that preys upon timber.

Another fruitful source of destruction to the forests is the keeping up of fences throughout the country. There are few hedges in Sweden; in the south the fields are divided by broad dykes and mud banks, and the loss of land to the farmer by this plan is considerable, to say nothing of the hot-beds for weeds, which these dykes afford, for the farmer in the south never thinks of keeping his banks and dykes clean. But in all the midland districts wooden fences are used, not as in England, a strong three-railed fence which will stand a man's life, and keep a fat rushing bullock within bounds, but a close snake-fence, formed by driving into the ground two upright posts about ten or twelve feet high opposite each other and at about four feet distance, and then sticking split rough rails of about ten feet length in a slanting horizontal position above each other closely packed together to form a close fence about four feet high. Putting aside the expense and trouble of keeping up such a fence, nothing can be uglier (for the upright posts stand over the fence at all heights to four feet); in fact, they quite spoil the appearance of the country, and I fancy that no fence in the world could be worse adapted to this climate, for being close, the snow banks up against them, and often breaks them down in lengths of fifteen or twenty yards. Moreover,

they seem to be always out of repair, and give the country quite a shabby appearance, and as the upright posts are often rotten at the bottom, a six-months' old calf can shoot through them in many places just as he could through a sheet of brown paper. These fences are only calculated to last twenty years. And now let us see according to Bishop Agardth's calculation, what an expense they are to the landholder, and what a quantity of valuable wood goes to their maintenance. Taking the value of a fathom of wood as it stands in the forests at 3 rqr., and reckoning each such fathom as three feet long, six feet broad, and six feet high, and using upon the average four trees, and calculating that this fathom of wood will furnish three loads of long wood, each being sufficient for five fathoms of fencing, then, each fathom of fencing will cost 20 ö., and adding 10 ö. per fathom for labour, we may reckon in round numbers the total cost of such fencing at 30 ö., or about 4d. per fathom.

Sweden is divided into hemmans or mantals, after which the size and the relative value of an estate is reckoned; a whole hemman being the limit of this reckoning, after which the hemman is divided into one-half or one-fourth mantals, meaning in the olden time as large a piece of land as would support a man and his family, whence the name is derived.

In Sweden there are 65,000 whole hemmans, and they calculate that each hemman has to keep up 4700 fathoms of fences, which, reckoning that a fence stands for twenty years, gives us 235 fathoms every year, at an expense of 12 sk., or 3d. per fathom at the lowest, or 59 rqr. per hemman, or 2,000,000 rix-dollars yearly, for maintaining the fences of all the 65,000 hemmans. For the 65,000 hemmans 305,500,000 fathoms of fencing are required, and 60,000,000 trees great and small will be annually consumed in keeping them up.

To remedy this dreadful waste, the only plan, as Agardth observes, would be to plant willow or sallow fences which will grow on all cultivated lands. I see now that many gentlemen are improving the style of fences on their estates,

and substituting neat three-rail fences for these unsightly snake fences; but as for the Swedish peasant of the present generation it can never be expected that he will deviate from the fashion of his forefathers.

In burning the yearly amount of charcoal in 1854, which then amounted to 1,986,530 loads, of 12 barrels to the load, 5,221,126 tunnland of forest were used. This is 225 Swedish square miles, at an average of 4⅓ tunna charcoal per tunnland. Ström reckons that 7 cubic feet of wood is required for every tunna of charcoal.

In 1863 the export of timber from Sweden was as follows:—

Beams (Bjelkar) square timber of all lengths above 8 in. square; and *Balks* (sharrar) small square timber of all lengths, 751,731 pieces.

The price of beams in the London Market in 1863, was 50s. to 52s. per load; of balks, 35s. to 45s. per load.

Boards of all dimensions of fir, and pine plank, or plank deals 3 × 11 and 3 × 9 in., 1,938,423 dozens; of these 1,882,000 pieces went to England, and the price in the London Market was £7 to £8 per Petersburg standard. *Deal ends*, 508,560 dozens; *masts, spars, and poles, etc.*, 21,258 dozens; *tar*, 117,873 barrels.

In 1854, which was the largest export year perhaps ever known, the value of the export of timber from Gothenburg alone amounted to 18,150,000 rqr. rmt., or above one million pound sterling, and the prices free on board at that port were as follows (and they are about the same in 1864):—

Boards and Planks under 1½ in. thickness, 7 rqr. per dozen; 1½ to 3 in. thickness, 15 rqr. per dozen; larger dimensions, 30 rqr. per dozen.

Deal Ends 3 feet long, 1½ in. thick, 1 rqr. 6 sk. (1s. 3d.) per dozen; 3 feet long, 1½ to 3 in. thick, 2 rqr.; 8 feet long, under 1½ in. thick, 2 rqr. 16 sk.; 12 feet long, 1½ to 3 in. thick, 4 rqr.

Square Timber over 8 in. square, and small square timber, 5 in. square, 3 rqr. per piece; 8 in. square, 4 rqr. 24 sk.; 8 in. to 10 in. square, 6 rqr.

The export from Sweden to the London market in 1863, was worth £317,416.

The prices in the Wermland forest in 1864, for timber to be delivered, free on board, at the nearest station, were as follows :—

Timber 22 feet long, 12 in. across at the small end, 46 rqr. to 56 rqr. per dozen (Tolfter) ; 11 in. across, 25 per cent. less ; 10 in. across, 50 per cent. less.

Sleepers 4½ feet long, 8 in. across at the small end, about 4d. each ; 9 in. across, about 5d. each ; 10 in. about 7d. each.

Lath wood of pine for splitting laths, per cubic fathom of 216 feet English, 3 to 6 feet long, 55 rqr. ; 8 feet long, 72 rqr. (including cost of cutting and carrying, at least 15 rqr. per fathom) ; and this is worth in the London market £7 to £8 10s.

Oars.—Rough hewn, 30 feet long, 8 in. blade, 3 rqr. per pair ; and out of this we must deduct about 10d., the cost of cutting and transport.

Pit Props 12 feet long, 3 in. across at the small end, about 1½d. each ; 24 feet long, 6 in. at the small end, about 9d. each ; of these latter they are now cutting and exporting millions to England yearly. Nothing ruins the forest like cutting lath wood and these pit props, for nothing but the very best and straightest pines, free from knots, will do for lath wood, and the waste of the young timber in pit props is dreadful.

One great drawback to the forest owner in Sweden, is the great expense of transporting his timber out of the forest to the nearest harbour. That the prices of timber in the forest district are little enough, will be proved by the foregoing table, and from these we have to deduct the cost of felling and trimming the trees in the forest, and the driving them down to the nearest harbour, often at some little distance. The English reader has only to compare the prices of timber in England with this list, and he will then see how very little of the cost goes into the pocket of the forest owner.

If the forests were managed properly as before suggested, it would not be of so much consequence, for the clearings of the forest would be used for pit props at least.

Reckoning after 5 rqr. per fathom, a cubic foot of *wood* will scarcely be worth more than 2 sk. rmt.; but a cubic foot of *timber* will be worth about 16 sk., and when it is sawed into planks, about 24 sk.; so this proves the folly of cutting small timber.

Fire wood, ready split, delivered at the nearest harbour, per cubic fathom (144 cubic feet)—Birch, about 18 rqr; pine, 8 rqr; fir, 6 rqr. The freight from the north of the Lake Wener down to Gothenburg, is about 5d. per fathom.

The principal tar comes down from the Norrland forests on the Bothnia, where very little charcoal is burned, but in the winter we saw charcoal burning going on in every forest.

I never saw any tar made in Wermland, except for home consumption. Very little fir, but principally pine, is used in burning tar. In the root and in the older wood, which in these forests they call "tyre," much "hartz" is collected, on which account this tyre wood burns like tallow, and is used every where in the forest instead of candles. I never used it for this purpose, but for lighting up a bush fire or leistering at night, I well know its value.

This tar-making is greatly mismanaged, because it scarcely ever seems to pay for the labour. Twelve cubic ells (two feet) of split tyre wood is supposed to give one tunna of tar. In Norrland, according to Ekman, in 1848, the cost of working a tunna in the forest, would come to 14 rqr. 42 sk., although its price at the leading place was scarcely ever 6 rqr. But I suppose a man's day's work in these wild forests where the tar is burnt, is worth very little, and as he gets his tyre wood for nothing, it is almost all profit.

The trees in these forests are subject to certain epidemics or diseases, and the attacks of many species of insects. The storm often passes over the forests, and blows down

thousands of trees, and now and then a fire rages in the summer, and sweeps down many acres. I never had the luck to see a real good "bush fire" in Sweden. In the Norrland forests, I believe, these fires rage more or less during the whole summer in some part or other of the forests.

Bishop Agardth so graphically describes the timber working in these northern forests, that I make no apology for inserting an extract here :—

"As soon as the ground becomes frozen in the autumn, all the men living in a forest district betake themselves to the woods, armed with their axes and skeder, and provided with meal, herrings, cheese, horses, sledges, and fodder. They have already dug some holes in the ground, about two feet deep, over which they have built a cover with an opening for the smoke. This sort of hut is called a kuja, and here the woodmen live through the winter, and seek their homes only on a Sunday. Every morning they go out into the woods to fell the timber, and drive it into heaps called 'tunnar.' As soon as the snow has become set, and the ice on the lakes bears, they draw the timber from the forest to the nearest draught of water, or to some place with a high perpendicular bank, called a 'lop,' down which they shoot the logs upon the ice. Among these workmen are a better class called timber markers, who superintend the whole work, and set the owners' names upon each log. The horses stand, through the whole winter, by the side of the huts without any shelter, nor do they appear in the least to mind it. All brandy and quarrelling among the men is strictly forbidden."

The felling of the trees appears to be conducted with great waste. The workmen set about their work very carelessly. They never use a saw, always an axe. They never bend their backs to their work, but stand nearly upright, and consequently cut down the tree about four feet from the root, on which account the most valuable part of the timber, that is to say, the lowest part of the stem, is left in the ground and altogether lost.

As the ice melts in the spring the stream carries with it the logs, which lie upon the ice, down to the river, into "länsor" which are ready to receive them, and here each owner looks for his mark, collects his timber, binds them together in long timber rafts, sixty or seventy alns long, and floats them down either to the saw-works or a harbour.

These "länsor" are a sort of floating harbours to keep the timber at the side of the river, that it may not be carried down by the stream. A lot of trees are chained together by the ends, and placed across the stream to hem in all the logs which float down within their boundary. Many thousand logs are thus collected in great masses. It sometimes happens that these "länsor" break, then the trees are carried down the stream by hundreds, crush down anything that opposes them, and do not rest till they reach the still water in the lake, into which the river falls.

One night in Carlstad, some years since, the inhabitants were wakened by the report of a cannon and the beating of drums, and as this is the signal of fire in the northern towns, they all sprang up in great consternation; but it was no fire. One of these "länsor" had sprung about two miles up the river Klar; the logs came tumbling down the stream one over the other like a shoal of sea monsters, but as soon as they reached the bridges they were stopped by the piles. Fresh logs were brought down every minute, which thundered like battering rams against the wooden wall, which was gradually becoming higher and higher, and there was every probability of the two bridges (one of which was the largest in Sweden, with twelve arches) being carried away. The river kept rising and threatened an inundation to the town. By the exertions, however, of the inhabitants, who stepped out on the logs with boat-hooks, and forced the timber through the arches, the bridges were saved and the timber which was carried down the stream floated into the Wener, and many weeks elapsed before it was recovered by the owners. It must have been a strange and wild scene on this night.

AGRICULTURE.

As I shall have occasion to go more deeply into this subject in a future chapter, I shall only here trouble the reader with a few statistical observations, but I may remark that although the export of corn is yearly on the increase, and great improvements are yearly being made in the system of agriculture throughout the land, Sweden can never, in my opinion, become a great corn exporting country. The climate, except just on the south and south-eastern coast, and the hard nature of the soil, both forbid it. The timber crop is the true harvest of the north, and if this is neglected, the loss can never be replaced by any amount of corn that may be grown in Sweden.

Still, the well-doing of the country is all dependent upon a prosperous state of agriculture, and as nearly seven-eighths of the population live in the country, and are more or less interested in the culture of the soil, it behoves every Swede to do his best to uphold the plough, for it is my opinion that two-thirds of the farms in Sweden could be brought to bear much heavier crops if the land now under cultivation were made the most of.

That there are great defects in the management and farming of estates here cannot be denied. These defects can, however, be all remedied, and doubtless, in ten years, we shall see a decided improvement in the agricultural statistics of this country. But be this as it may, the Swedish farmer will still have the climate and the nature of the soil to contend against, and in no other country that I know of, are capital, practical experience, attention, energy, and down right hard labour, more required in the management of a farm than in this. Sweden is no country for gentlemen farmers without capital.

Respecting the present state of agriculture here, it appears, from the statistics quoted below, that the import of dairy produce into Sweden in the year 1862, exceeded the

export to an alarming extent, and in nearly every article this import shows a decided increase.

The export of corn is certainly on the increase, but it shows no very decided improvement, for it appears that in 1860, 10,950,378 cubic feet of all sorts of corn were exported, and in 1863, 12,326,914 cubic feet.

In 1862 the export exceeded the import by 5,181,436 cubic feet, the value of which, according to the editor of the "Stockholm Farming Magazine," could not be reckoned at more than 5,000,000 rqr., or in round numbers, £300,000 English. It is hard to say what is the area of cultivated land in Sweden, but we shall not perhaps, be very far wrong if we reckon it at about 5,000,000 English acres, and this, in 1862, after producing corn enough for the supply of a population of 4,000,000 people, left a yearly export, above the import, to the value of £300,000.

In 1863 the export of corn from Sweden to London was:—Wheat, 744 quarters, at from 45s. Barley, 6249 quarters, at 28s. 6d., showing a very great falling off, for in 1860, 31,615 quarters were exported. Oats, 630,978 quarters, at 20s.

In this year the export of oats into London from other countries, was 920,817 quarters; of these 40,808 quarters came from Norway.

Thus, the export of oats into London from Sweden is over 40 per cent., against 21 per cent. from Russia, 17 per cent. from Denmark, and 8 per cent. from Prussia. The value of the oat export from Sweden to London alone in 1863 might be reckoned at £625,000.

Although this cannot be considered as any very large export, it is great when compared with that of former years, for previous to 1840 (about twenty-five years ago) Sweden was obliged to import every year considerably more corn than the country produced, and since that time the export has been gradually on the increase. Now let us turn again to Agardth on this important subject of produce and consumption. Writing in 1859, he says:—

"The population of Sweden in the end of 1858, may be reckoned at 3,733,000 souls, who, after an average of two and a half tunna corn, and one tunna potatoes, yearly for each person, will, in round numbers, consume yearly 8,710,000 tunna of corn, and 3,733,000 tunna of potatoes. For the dairies and stables we shall require yearly 1,000,000 tunna corn and 750,000 tunna potatoes; and for the distillery of 15,000,000 kanna of branvin, 392,000 tunna of corn and 1,091,000 tunna of potatoes; and the balance or surplus over the land's own requirements, which the production leaves (taken after the average of five years, 1852-57), comes to about 700,000 tunna, so that the total production of the land will be 10,802,000 tunna of corn and 5,574,000 tunna of potatoes. This result is, however, higher than that given us by the government statistics for 1851-55, viz., 9,778,370 tunna of corn, and 5,429,545 tunna of potatoes.

"If we reckon that one tunna of potatoes is equal to one-third of a tunna of corn, and after this proportion reduce the potato crop, we find a corn production for the whole country of about 12,660,000 tunna, which, after five tunna per tunnland, gives us an area of arable or corn producing land of 2,532,000 tunnland. But, as on an average one-third of the arable land yearly lies fallow, so we must add one-third to the above total, which brings it to 3,376,000 tunnland (or 145 Swedish square miles). Other statistics, however, reckon it at 4,000,000 tunnland in 1864. This is not much in proportion to the whole area of the land compared with other countries. In Great Britain it is reckoned that 16,000,000 tunnland are open arable land, and Belgium, whose whole surface is less than that of either of the two Swedish provinces, Smaland or Dalaroe, has about 3,300,000 tunnland of open arable land. With the exception of Norway, there is, perhaps, no other country in Europe whose arable land occupies so small a proportion to its surface as Sweden."

Wheat is very little grown in Sweden, the principal produce being rye and oats.

According to the Customs' returns in 1862, the export and import of corn, from Sweden, was as follows :—

EXPORT.

92,044	cubic feet	of wheat.
225,648	,,	rye.
1,086,225	,,	barley and malt.
50,121	,,	pease.
2,748	,,	vetches.
37	,,	mixed corn.
6,296,468	,,	oats.

Or, altogether, 7,753,291 cubic feet of corn, and 6,169 cwt. of meal.

IMPORT.

120,384	cubic feet	of wheat.
1,981,733	,,	rye.
237,316	,,	barley and malt.
90,755	,,	pease.
635	,,	vetches.
11	,,	buck wheat.
7,268	,,	oats.

Or, altogether, 2,438,102 cubic feet of corn, and 229,090 cwt. of meal.

Supposing that one cwt. of meal answers to three-fifths of a cubic foot of unground corn, so we may reckon the export of corn at 7,756,992 cubic feet, and the import at 2,575,556 cubic feet.

The export consequently exceeded the import by 5,181,436 cubic feet; but as this surplus chiefly consisted of oats, and a good deal of the imported corn must be reckoned as of more proportionate value than the exported, we cannot calculate safely that the surplus export was of more value to the land than about 5,000,000 rix-dollars, or less than £250,000 English.

This export comes chiefly from Skane, West and East Gotland, and the four provinces around the lake Mälar.

The Swedish farmers are just now calling loudly for pro-

tection, and I insert a capital letter on this subject, evidently, however, from the pen of a protectionist, which I copied from the Stockholm newspaper of February 25th, 1864. This will, doubtless, be interesting to the British, as well as the Swedish political economist. It was entitled "What does a tunna of corn cost to produce in Sweden at the present time?" I am induced to give a literal translation of it, without at all answering for its correctness myself, but I never observed that it was contradicted. The writer says:—

"The cultivated land in Sweden is little above four million tunnland (or not quite 5,000,000 English acres); according to Agardth the total area of Sweden is 3868 Swedish square miles, and these he divides as follows:—

	Swedish Square Miles.	
Cultivated land	85	
Meadow and pasture	200	
		285
The four great lakes		82
Other lakes, etc.		416
Fells, etc.		1000
Forests		2085
		3868

"In 1860, the produce of the cultivated land was 16,171,780 tunna of corn, and 8,000,000 tunna of bulbs (potatoes, turnips, etc). Taking eight tunna of potatoes as equivalent to one tunna of rye, the average produce of the whole land may be estimated at 435 tunna per tunnland (or less than three English quarters to the acre), and the medium price of all the corn produced was that year 10 rqr. 67 ö. per tunna, or say about 12s. 6d. for the English four bushels.

"The cost of cultivating the land may be reckoned at one-half more than the cost of the corn sown as seed, thus taking five-eights of a tunna at 6 rqr. 65 ö. for seed, we have 9 rqr. 97 ö. per tunnland for cost of labour. The cost of upholding houses and implements may generally be calculated at 2 rqr.

for every tunnland of cultivated land. The proportion of cultivated land to pasture is as one to three.

"In 1856, the mortgage debts on all the estates throughout Sweden amounted to 400,000,000 rix-dollars (or about £22,000,000 sterling), and these have certainly rather decreased than increased; and at the rate of five per cent. the yearly interest of this debt charged upon the land will amount to 20,000,000 rqr., or on each tunnland of cultivated land 3 rqr. 32 ö., besides 94 ö. on each tunnland as the yearly interest on another debt, called the "Amortering Hypotheks Loan," which in 1858, amounted to about 114,000,000 rqr. These debts are principally charged on the south and midland districts.

"Forsyth lays all the taxes on the land at about 20,000,000 rqr. yearly (including soldiers, state, church, poor, etc.); but these have much increased since his time.

"The yearly consumption for 3,425,509 people (these have now, in 1864, increased to 4,000,000), besides half of the root produce (the other half he gives to brandy distilling), he reckons at 8,000,000 tunna of corn, and 2,000,000 for the dairies and stables, or, making together, a yearly sum of 105,000,000 rqr. He allows a charge upon each hemman throughout the country for buying dairy produce, which the land cannot itself produce, as follows:—

	lisp.	sk.		rqr.		rqr.	ö.
Butter	1	16	at	10	per lispund	10	80
Cheese	0	88	,,	3	,,	2	64
Pork	0	37	,,	5	,,	1	85
Meat	0	59	,,	4	,,	2	36

Which gives for the whole 65,000 hemmans, into which the country is divided, a yearly charge of—

	rqr.
Butter . . .	650,000
Cheese . . .	189,000
Pork	120,000
Meat	153,000
	1,112,000

Besides this are groceries, etc., which, as it is computed that those who live on land pay ninety per cent. of all the taxes, cannot be estimated at less than 50 rqr. on each household, or for all the land people 625,994 rqr. (In 1860 they reckoned for each household fifty-five lb. coffee, twenty-one lb. sugar, and one and a half tunna salt yearly.)

"This gives us a yearly charge on every tunnland of land:—

	rqs.	ö.
Cost of tillage	9	97
Corn for sowing	6	65
Repairs, etc.	1	32
Interest on the mortgage loan	3	32
Interest on the "Amortering Hypotheks Loan"	0	94
Taxes of all kinds	2	60
Cost of living after deducting cost of cultivation	12	89
	37	69

"It consequently follows that the medium price of 1,06 tunna of corn must not be under 8 rqr. 86 ö. if agriculture shall flourish. But, as from 1854 to 1863 the medium price was only 8 rqr. 50 ö., it is clear there must have been a loss."

The reader must, however, bear in mind that this reckoning is based upon the present produce of the land, at current prices. That prices will rise much within the next twenty-five years I do not expect, but that this 4,000,000 tunnland could be made to give a much better produce, and this at a trifling further expense of cultivation after the land is once improved, I think I shall satisfactorily prove in my chapter on the agriculture of the country. Allowing these statements to be correct, and we have every reason to believe that they are, it is plain that all the Swedish farmer has to trust to, is a better system of managing and farming his land. It is very unlikely that any rise will take place in the present prices of corn (except indeed in case of war);

whereas the price of labour is yearly rising in Sweden; the expense of living is also increasing, without any reference to the price of corn, or meat, and unless the land can be brought to bear better crops, by an improved system of husbandry, it certainly does seem that the farmer will require some protection, and, in my idea, this protection lies in a great measure in his own hands.

Cattle breeding, and dairy produce, apparently stand at a very low figure in Sweden at the present day; and this is the more to be wondered at, when we consider that milk and butter, pork and wool, are such great items in the Swedish household economy among all classes, and that according to Agardth, throughout Europe it is reckoned for every 100 persons there are 8 horses, 33 horned cattle, 80 sheep, and 16 pigs. Now in Sweden it appears in 1855 there were for every 100 persons 11 horses, 53 horned cattle, 44 sheep, and 16 pigs. So, with the exception of sheep, Sweden appears to have a very fair proportion.

The total number of cattle in Sweden in 1855 was as follows:—

			rqr.
Horses	398,507	at 200 rqr. each	79,701,400
Oxen	311,830	„ 130 „	40,537,900
Cows	1,112,295	„ 60 „	66,737,700
Young Cattle	494,695	„ 30 „	14,840,850
Sheep	1,592,254	„ 10 „	15,922,540
Pigs	564,134	„ 60 „	33,848,040
Goats	172,926	„ 5 „	864,630
Reindeer	86,945	„ 20 „	1,738,300
	Total value		254,191,360

And although, doubtless, the numbers may have proportionately increased within the last nine years, still the value of the different cattle individually remains much about the same.

The number of reindeer is only officially given in Lulea Lapland, but the reindeer is used in at least two other Lands—Umea, where in 1855 there were 143 Laps, and in Ostersund 47 Laps, who owned reindeer.

Calculating after the number of reindeer which each Lap in Lulea Lapland owned (120), and allowing the same number to every Lap who owns them, which I think we can safely do, we may reckon the number of reindeer in the whole country as 110,000.

The dairy produce of a cow in England, according to Agardth, may be reckoned at least double that of a Swedish cow, and the two millions of horned cattle which are yearly slaughtered in Britain leave an average weight of meat of 588 lb., while the Swedish horned cattle which are slaughtered certainly do not on an average give more than 190 lb. of meat each. And this may be the case as the cows are usually managed; but it has been proved by trials —and all the best practical men with whom I have spoken on this subject, have given it as their opinion—that with proper food and proper care, the little Swedish cows will give more milk in this country at a less cost than a large English cow will, if both are fed properly. There is no doubt, however, that the English breed of pigs and sheep are far better, and pay much better here than the Swedish, for on Gardsjo Mr. Stenstrom has told me that he has clipped ten to fifteen lb. of wool in a year off a large English ram, and when killed the same ram weighed 160 lb. dead weight. There is no doubt, however, that the Swedish cattle can never bring anything like the weight of beef which the English will.

Agardth further observes that with improvement the value of the Swedish cattle, instead of being 260,000,000 rqr., might easily be raised to 714,000,000 rqr.

In 1860, little Denmark exported dairy produce to the value of 25,808,000 rqr., or more than the export of wrought iron and steel from Sweden, which in that year amounted to about 22,000,000 rqr. Now, according to Agardth, Skane and some two or three other lands in South Sweden are quite as productive as Denmark, which does not exceed them in size, and contains two and three-quarter millions inhabitants.

The average weight of wool from each sheep in England he puts at 4 lb. yearly, and on an average each sheep that

is slaughtered will give 85 lb. of mutton. In Sweden he says the average clip of wool will be about 2 lb., and the weight of mutton 20 lb.; and I believe, as far as regards the peasants' sheep, this is correct.

In 1862, the import of the following articles of dairy produce, etc., exceeded the export (according to the Swedish "Farmer's Magazine"):—

Butter	(import exceeded export by)	20,585	cwt.
Tallow	,, ,,	37,571	,,
Cheese	,, ,,	11,314	,,
Pork	,, ,,	24,486	,,
Meat	,, ,,	5,920	,,
Hides, dry	,, ,,	7,376	,,
,, salted	,, ,,	19,784	,,
,, wet salted	,, ,,	22,522	,,
Wool of all kinds	,,	2,658,298	lb.

Still, however, showing a decided improvement in everything except pork, which was just double that of the preceding year.

From the year 1849 to 1858, 172,000 tunnland of waste land were brought into cultivation; in the year 1860, 37,414 more; and every year much waste land, mosses, and small forests come under the plough. The cost of bringing such land into cultivation is not much, and new land let thus (if only properly chosen) will rear many crops without manure.

According to Malmström, however, the improvement of agriculture in Sweden has been followed by an increased mortgaging of estates throughout the whole country. It is not easy to say what is the actual amount of the mortgage debts advanced by the different mortgage (Hypotheks Lan) societies; but it appears by the above-quoted article from the Stockholm newspaper of Feb. 25th, 1864, that in 1856 this debt amounted to about 400,000,000 rqr. (and it has doubtless much increased), and at the rate of 5 per cent. the yearly interest of this debt is 20,000,000 rqr.

or on each tunnland of cultivated land throughout the country 3 rqr. 32 ö.

Malmström adds :—"From the year 1835 this mortgage debt has been steadily increasing, and this evidences a greater speculation in estates and an increased price, because usually a greater or lesser part of the purchase-money is allowed to remain on mortgage; and to what a degree land speculation has risen in Sweden is proved by the fact that estates in the country in 1831 were sold for the amount of 23,000,000 rqr., in 1845 for 32,000,000 rqr., in 1855 for 67,000,000 rqr., in 1857 for 94,000,000 rqr., in 1858 for 67,000,000 rqr., and in 1859 for 64,000,000 rqr. The great increase in 1857 was owing to the fact that the harvests of the two previous years had been good, prices had temporarily risen, and people were literally mad to buy estates. Now, however, there is not nearly so much speculation, and estates have consequently fallen in value.

The great increase in land speculation, as well as in the amount of the mortgage debt, is owing to the facility of borrowing money which was furnished to the buyers of estates by hypothek (or mortgage) companies, the first of which, that in Skane, was established in 1836. Now there are ten such companies. These, however, are all amalgamated into one Hypotheks' Bank, which furnishes money to the others, and regulates their operations. In 1861 the then existing hypotheks institutions lent out 75,782,457 rix-dollars.

Well may Agardth remark that "want of capital is an old complaint in Sweden, and we have from time out of mind endeavoured to help ourselves by borrowing. But the loan must be repaid, and our produce has never yet been able to keep pace with our obligations, much less to encourage us in employing new capital. Our products quickened for a time by this false support, have, as soon as it has been withdrawn, relapsed again into an imbecility even greater than that from which they have just sprung, and a need of fresh obligations has returned only the more pressing, and has been the more severely felt, because to poverty is now added debt. Is it

possible that even to this day, we must continue to have recourse to a practice so costly and yet so often repeated." But I shall have occasion, in my chapter on the agriculture of the country, to enter more fully into this subject.

Commerce and manufactures are both yearly increasing. Since 1854, a much freer system of trade has been introduced into the country, and the free-traders say, and they are probably right, that this has had a very beneficial effect upon commerce. In fact, I believe that now no foreign articles are forbidden to be imported. The Customs duties have also been greatly lessened.

In 1840, the value of articles manufactured in Sweden was estimated by the Customs at 21,000,000 rqr.; in 1850, at 37,000,000 rqr.; in 1860, at 59,000,000 rqr.

The workpeople employed in the various manufactories in 1840, amounted to 15,410; in 1850, to 23,427; and in 1860, to 30,757. Before the American war broke out, the cotton spinneries held the first rank among Swedish manufactories; the value of their manufactured cotton goods being in 1860, 12,182,000 rqr., in which 4021 hands were employed. The value of cloth manufactured in the country in that year was 9,190,000 rqr. which employed 2981 hands. The value of the sugar refined in the country was 11,925,000 rqr.

It is only since 1861 that the distillery of "Branvin," the common brandy of the country, from rye and potatoes, has been taken under the control of government. Formerly any private person could distil. Brandy was much cheaper and easier to procure, and the consumption, among the lower classes especially, was something frightful. Twenty years ago Branvin was used in the country like money as a circulating medium among the peasants. In fact, at that time they had little or no money, for the whole produce of their farms, rye and potatoes, was consumed in the distilleries, and but little went to market. Branvin was indeed the staff of life. The English reader will be surprised to hear that at that time landed proprietors (most of whom owned private distilleries) have been known to pay their servants' wages in brandy.

The consumption of brandy has certainly, of late years,

however, much decreased, and most of the better classes now endeavour, by all means in their power, to reform the vice of drunkenness among the lower orders, and except at fairs, auctions, and private jollifications, we do not often see a drunken peasant.

In 1863, however, 16,202,557 kanna of brandy were returned from the different distilleries in the country, and putting this on an average at retail price, of about 2s. per kanna or four bottles, the consumption of corn brandy alone in Sweden (and I never heard that any was exported from the country), covered a sum of no less than 32,000,000 of rix-dollars, allowing about four kanna or about two and a half gallons for every man, woman, and child in the country. Besides this, we must consider the quantity of wine and foreign spirits imported into the country. We must, however, take into consideration that this brandy has not half the strength of any other spirit. Its strength at the distillery being 50 per cent.

There are now, however, some very good porter and bitter beer breweries in the country, and much more ale and porter is annually drunk than formerly; but I always fancied the bottled beer very dear, as compared to the English, and not half so strong or good.

In Great Britain, I believe the yearly consumption of spirits is reckoned at three-fourths of a gallon, or about one Swedish kanna for each person. In Prussia three gallons. In California, a few years since, the consumption was reckoned at 5000 gallons of spirits daily, or one-sixth of a gallon for each person. Could this be possible?

I do not, however, think that the actual *taste* for raw spirits among the lower classes (especially of the old school) has much abated; but there is now much more difficulty in procuring it, especially in the country, than formerly. There are plenty of "sly grog-shops" scattered about the forests, which seem to answer, although the fine is heavy when they are convicted. They tell me that Carlstad jail would have "lodgings to let," if it were not for these illicit vendors of branvin.

It is a curious thing that we very rarely see a Swedish gentleman much the worse for liquor. They take their social glass, but they do not drink in the business-like manner of the English. They appear to be in possession of the famous secret which an old incorrigible friend of mine once told me he had been sixty years trying to discover. "He always knew," so he told me, "when he had drunk too little, and also when he had drunk too much, but never when he had drunk *just enough*."

The laws against drunkenness in Sweden are rather severe, but very little heeded except in towns. It is clear that a very great change has been effected for the better within the last twenty years in the habits and condition of the Swedish peasant; and I believe much is owing to the increased difficulty of procuring spirits except in towns; for we all know—

> "What Shakspeare observes, in his play of King John,
> Is undoubtedly right;
> That oft times the sight
> Of means to do ill deeds, will make ill deeds be done."

Much more attention is paid to the education of their children, which is proved by the number of priests in Sweden, who have risen from the ranks of the peasants.

In 1861, 56,861 persons were employed throughout the land in handicraft.

The inland commerce, which was formerly hampered with many restrictions, is now free: and in 1860, 1929 small vessels of 70,000 English tons burden were employed in transporting goods up and down the country, and in the coasting trade. But much of the inland commerce is carried on by small steamers, the total number of which in 1860 was 203, of about 9,332 horse-power.

The foreign commerce shows a decided increase within the last few years. The total value of exported and imported goods into this country in 1835 was taxed at 51,000,000 of rix-dollars; in 1840, at 58,000,000 rqr.; in 1850, at 73,000,000 rqr.; and in 1860, at 169,000,000 rqr.

The principal exports from Sweden, as we have already shown, are timber, iron, and oats, and the principal imports into the country are sugar, coffee, cotton, wool, hides, salt, and tobacco.

In 1860, 35,707,000 lb. of raw, and 3,671,000 lb. of refined sugar, and of coffee 15,000,000 lb. were imported, being just treble the imports of twenty years back.

It is curious to see how the taste for coffee has increased in these northern climes during the last century. In 1740, when the population of Sweden amounted to 1,615,000 people, the consumption of coffee was only 13,701 lb., and of sugar 1,675,034 lb. In 1860, the yearly consumption was, of coffee, above 4 lb. and of sugar 10 lb. to every person in the country. But tea and wine are not much drunk in Sweden, the consumption in 1860 being, of tea 0.02 lb. and of wine 0.16 kanna to each person. In Norway the consumption of coffee is even greater, being about 8 lb. yearly to each person. The tea which you generally get here, is, as they very properly call it, in comparison to what we brew in England, "tea-water;" but they can make you a good cup of coffee.

The import of salt in 1860 was above 2,000,000 cubic feet; wool, 2,500,000 lb.; tobacco blade, 4,000,000 lb. In that year the principal exports were as follows:—1,390,000 dozen boards and planks; 620,000 dozen beams; of bar iron, 2296 cwt.; of corn, 10,850,000 cubic feet; and of lucifer matches 433,745 rqr. in value.

The Custom duties in all amounted, in 1860, to 13,422,000 rix-dollars; of which sugar paid 3,333,000 rqr.; cloth, 2,400,000 rqr.; coffee, 1,515,000 rqr.; tobacco, 1,333,000 rqr.

The value of the principal imports in 1860 was reckoned as follows:—

	rqr.
Sugar	12,100,000
Cotton wool	10,200,000
Coffee	9,100,000
Cloth	7,000,000

	rqr.
Tobacco	6,100,000
Hides	4,900,000
Fish	4,500,000
Coal	3,800,000

The greatest foreign trade is with England. The total value of export into that country in 1860 from Sweden was 42,000,000 rqr., which included more than half of their bar iron and two-thirds of their corn. The value of the import from England into Sweden in the same year was taxed at 16,500,000 rqr., which included 7,000,000 lb. cotton wool and 11,770,000 cubic feet of coal. The next greatest import was from Lubeck.

The burden or tonnage of the Swedish merchant fleet in 1860 was reckoned at 154,342 läst, besides an inland fleet of canal boats and coasters of 20,608 läst.

Another fruitful source of riches to this land seems hardly made the most of. I allude to the fisheries. A curious feature in the icthyology of these coasts is the appearance of the herrings at irregular seasons, and their sudden disappearance without any apparent cause. In the beginning of 1300 they appeared on these coasts in immense shoals, but shortly disappeared, and few were again seen until 1556.

The largest herring fishery ever known off these coasts was in 1587. After that, however, they were not again seen in any numbers till 1660; and in 1675, when the war with Norway broke out, they altogether disappeared. In 1727 they came back, but there seems to have been then neither men nor nets on the coasts to take them. They disappeared, but returned again in 1747, remained off the coasts till 1808, when they went away, and have never since been seen in any great numbers.

It is true there is every year a small catch of herrings off the southern coast of Skane; and in Norway the herring fishery is a yearly source of profit. The yearly export of herrings from Norway even now reaches about 585,000 tunna,

of which 550,000 tunna are winter, and 35,000 tunna summer herrings.

But 1787 appears to have been the greatest season for herrings off the Swedish coast, when Gothenburg something resembled Melbourne in the early days of the gold diggings. On the Gothenburg coast alone in this year the fishermen, according to Nilsson, smoked above 4000 tunna, salted 400,000 tunna, pressed 2,000 tunna, and boiled down for oil about 1,066,000 tunna, (which yielded 44,000 casks of oil), or, consequently, 1,472,000 tunna herrings; and adding those that were consumed or sold in a fresh state, it was calculated that in that year above 1,500,000 tunna of herrings were taken off the Bohus Land coast, just outside Gothenburg; or reckoning the usual number of 1000 to the tunna, about 1,500,000,000 herrings; being, however, a very small proportion of the immense shoals which then frequented these coasts.

Many speculations have been hazarded respecting the cause of the almost total disappearance of the herrings from these shores, the two most feasible of which seem to be the casting out into the sea, during the great herring fishery, of the refuse from the oil-melting and salting-houses, and the immense destruction of small herrings by the use of the large nets called here "vaderne." These herring-nets, until 1852, were ninety fathoms' long, and six fathoms deep, and so fine that they had forty meshes to every two feet; but now it is not allowed to use a net of more than forty fathoms long, four fathoms deep, and the meshes must be one inch from knot to knot.

Every endeavour to bring back the herrings to these coasts since 1808 appears to have entirely failed, and about 60 to 100,000 tunna of small herrings is the yearly catch at the present day; but, as we have said before, in Norway the herring fishery still affords a good source of revenue.

The deep sea fishery grounds of the Bohus Land fishermen is a bank named "Jäderns Ground," lying in the North Sea about sixty Swedish miles from Marstrand, and fifteen from Egersund in Norway. The fishermen sail out to this bank, and are probably absent a month, but as they

formerly had no means on board to salt their fish, the fishery was of little value. In 1861, however, fourteen companies were established in Gothenburg to carry on the fishery properly. It seems that according to an old treaty in Charles Tenth's time, the Bohus Land fishermen have a right to fish on the Scottish banks with 1000 boats yearly. The principal catch in the deep sea fisheries are cod, ling, hallibut and coal fish.

But the best bank for the Swedish fishermen, because it is nearer home, lies off the Scaw in the north of Jutland. The boats go out for a week's cruise; each boat has six men, and if they are pretty lucky, they will bring back thirty "välar," or three hundred cod and ling in each boat, worth probably, when dried, 12 rqr. per välar. These dried fish are called "klipp" and "kabeljä."

But even the large fish have decreased in numbers on these coasts since the herring fishery, for at that time one hundred välar in one boat was not uncommon. Formerly the mackerel, lobster, and oyster fisheries on this Bohus Land coast, were something considerable, now, however, they yield very little profit.

In 1836, not less than 63,544 score of lobsters were exported from the Swedish coast, but the fishery gradually fell off till 1855, when the export was only 1977 score. Since then, it has rather risen, and in 1860, 6460 score were exported. But the principal part of the lobsters which are consumed in London, come from Norway, and it is reckoned that the English and French coast do not produce one half so many as those of Norway. It is said that for lobsters alone exported to England, the Norwegians receive £15,000 yearly. According to Agardth it is reckoned that the yearly consumption of fish in London, including shell-fish, amounts to above 4,000,000 lb.

Formerly the oyster fisheries yielded something considerable, now, however, the import exceeds the export.

The coasts of Aland and Gotland in the Baltic, are rich in fish, especially strömming (small herrings about eight inches long), cod, and flounders; but these fisheries are gradually

decreasing. The salmon fisheries in all the rivers on the southern and eastern coast, have considerably decreased of late years, and this they say is owing to the rivers becoming shallower and shallower, so that there is scarcely now a good place left where a net can be shot. At the present time, not a single whaler sails out of any Swedish port, although previous to 1780, a company of whalers existed in Gothenburg. The fresh water fisheries in the south and middle of Sweden, are of but little value to the State.

When we look upon this country, with such an immense extent of coast, and one-eighth of its surface occupied by inland lakes and abounding with such fine rivers, we should naturally suppose that it would be one of the richest lands in Europe, for both salt and fresh-water fish. But so far from this being the case, this immense extent of water instead of exporting largely, does not supply enough for the wants of 4,000,000 people.

The export of fish, like that of the dairy produce, is not only totally insignificant, but it is only of late years that it has shown the least improvement. On the other side, however, the import gradually increases till it has at length become a serious article in the economy of the country; for in 1860, the import of cod and herrings alone amounted to no less a sum than 3,600,000 rqr., or £200,000 sterling. In 1815, only 162,565 lispund of dry and smoked fish, and 550,000 lispund of salt fish were imported; but in 1860, the import of dried fish reached 971,825 lispund, and of salt fish 2,798,800 lispund, so that the increase in the import in forty-five years has been 67 per cent. of the former, and 409 per cent. of the latter.

Now the principal part of this import might surely have been obtained off their own coasts, or if not, other fish peculiar to the Swedish fresh or salt waters might have been substituted, and this heavy import from other lands have been saved.

Off the Lofoden Islands on the Norwegian coast, the greatest cod fishery in Europe is still carried on. From 1850 to 1855, the yearly number of fishermen employed in this fishery was

about 22,000, with 4500 boats; and the yearly number of fish caught amounted to about 20,000,000, besides 20,000 tunna of oil, and as much of roe, amounting together in value to 1,000,000 specie dollars or 4,000,000 rix-dollars. The usual catch of herrings off the Norwegian coast is 7,800,000 tunna yearly. The yearly export of this fish from Norway has during the present century been pretty even, and, in 1858, it amounted to 515,677 tunna. The total yearly worth of the Norwegian fisheries amounts to about 12,000,000 rix-dollars.

Although rich in many species of wild animals and game, it is never likely that the export of either skins or game from Sweden can hold any weight in the state's economy. We find, in 1815 (since which time this branch of commerce has not been strictly noted) not less than 20,708 skins of wild animals were *imported* into the country, among which were 452 bear skins, 9096 wolf and fox skins, and 280 sable, besides others to the amount of 24,040 rqr., whilst the export only amounted to 3896 skins, among which were twelve bear, 1826 wolf and fox, 149 dozen squirrel, and 218 ermine, besides other skins to the value of 1600 rqr. In 1859, the import was 37,990 lb. of prepared skins, besides skins sewed together to the amount of 10,842 rqr., whilst the export was 7319 lb. of prepared skins. In 1860, the import was 54,067 lb., besides furs to the amount of 3020 rqr., while the export amounted to 21,939 lb. I cannot think where all the reindeer skins go to.

It appears that the yearly average of bears killed in Sweden from the year 1849 to 1859 amounted to 117

Wolves	162
Lynxes	110
Foxes	5396
Martens	394
Otters	246
Weasels	1140
Seals	2323
Eagles, falcons, hawks	1908
Owls	1013

This table is taken from the returns of the head rangers in the different provinces, who pay a certain sum for every beast and bird of prey killed. Probably many more were killed of which no return was given. This return however, shows a falling off from previous years, and I fancy annually decreases, especially in the larger and wilder animals.

It seems that Norway and Finland are both richer than Sweden in animals and birds of prey; for, in Norway, between the years 1851 and 1855, the yearly average of bears killed was 203; wolves, 228; lynxes, 115; eagles, about 3000. In Finland, from the end of 1848 to 1850, 362 bears, 1995 wolves, 4352 foxes, 201 lynxes, and 191 gluttons were returned.

According to the Swedish "Sporting Magazine" for 1863, the loss sustained from wild animals throughout the whole country in five years, 1856—1860, was as follows :—

	rqr.
336 horses, at 100 rqr.	33,600
1556 horned cattle, at 50 rqr.	77,800
31,752 sheep and goats, at 3 rqr.	95,256
144 pigs, at 8 rqr.	1,152
29,160 chickens, geese, etc., at 50 ö.	14,580
1906 reindeer at 6 rqr.	11,436
	233,824

And the "vermin money" paid out by the different provinces for wild animals killed amounted to about 110,000 rqr. in the five years.

Strange as it may appear, the import of game and birds for the table into Sweden is very considerable.

Until about the year 1852, there was not a railway in Sweden, the principal part of the inland traffic and carriage being carried on by water; and on account of its numerous lakes and rivers no country in Europe can be better adapted for water carriage than Sweden. In 1852, the first railway was commenced in the middle of Sweden from Köping on the Lake Mälar to Hidt. This, however, was never

finished, and is, I believe, in the hands of some Englishmen. In 1863, the main line from Gothenburg to Stockholm, forty-two and a half Swedish miles, was finished at a cost of 34,654,285 rqr. (or about 2,000,000 English pounds for 280 English miles), and the traffic on this line during its first year has been considerable. It is contemplated to form a branch line from Malmo in the very south of Sweden through the country to join this main line about half way between Gothenburg and Stockholm. This branch is already completed from Malmo to Falköping (about fourteen Swedish miles), and it is expected that in 1866 the whole line will be complete. Another branch is in progress from Arvika, a little town which lies north-west of the Wener, a few miles from the Norwegian frontier, to join the main line also, and to pass through Wermland by Carlstad and Christinehamn. This will scarcely be completed under three years, but when these two branches are finished an excellent line of communication will be opened throughout Sweden, and nothing in my opinion will tend to develope the resources of this country so much as railroads. Already diligences run from Carlstad and other towns to meet the main line, and travelling in Sweden will soon be very different to what it was in the glorious old days of conveyance by the peasants' carts, one Swedish mile per hour, and about one hour to wait for each fresh relay of horses.

The time occupied between Gothenburg and Stockholm by the quick train is about eleven hours, for 280 English miles, including stoppages. The fares are—1st class, 31 rqr. 95 ö; 2nd class, 21 rqr. 30 ö; 3rd class, 10 rqr. 65 ö.

These three railways are all government works, but there is a private line from Fahlun to Gefle, about eight Swedish miles, which pays better than any other.

Telegraph wires are fixed all through the country, even up to Haparanda.

The post in Sweden is excellently conducted, and even in the days of old, when the bags were carried throughout the whole land by a single postillion in a peasant cart, mail robberies were not so often heard of as might have been

expected. I never, out of the many hundreds which have been sent to me, or which I have sent away, lost a single letter that I know of. One universal rate of postage, 12 ö. (or a little more than one penny English) is adopted throughout the whole country, and postage stamps are used, like the English.

The post from England is much cheaper and more expeditious than formerly. A single postage to and from England and any part of Sweden is 1s., and the letters can be either prepaid or not.

In the winter the mails are sent by Hamburg, and the letters are one week or ten days on the road, but from the beginning of March till November, the English mails are brought by steamers "viâ Hull," and if a letter is posted in London on the Friday, I can receive it up at Carlstad on the Wednesday following.

Newspapers also come very regularly, and when they are properly stamped in England, and sent viâ Hull, they come up for about 1d. postage on delivery, but in the winter, when they are sent viâ Belgium or Hamburg, there is no saying where they may travel or what they will cost when they arrive. I really have received them with so many post marks that the address has been scarcely legible.

Money letters should be registered in England; in Sweden we call it "recommended." If the letter is simply recommended, without stating the value of the enclosure, and lost, you can only recover the amount of 100 rqr., but if you show the contents to the post-master, government is liable for the whole amount. It is wonderful what an immense deal of money is sent yearly about Sweden through the post. Books can also be sent to and from England by the book-post.

THE RIVERS AND LAKES.

As may be supposed, these are both numerous and large, although in length the rivers will not bear comparison with those in many other parts of Europe. There is not a single river in Sweden or Norway above 300 English miles long.

The largest rivers in the north of the country are—the Tornea River, 42 Swedish miles long; Umea and Lulea River, 38; Pitea River, 31; Skelleftea, 34; Angerman River, 35; Liusnan, 32. All these flow into the Baltic.

There is not a river of any size in the south of the country. The great Tana River, which divides Sweden from Norwegian Lapland, is a magnificent stream, and flows into the Polar Sea, a little to the east of the North Cape. The scenery of some of the rivers, especially in the far north, is magnificent.

The two principal rivers running through the middle of the country, are the Klar and the Dal.

The Dal rises on the Norwegian fells, flows for about forty-two Swedish miles, in an easterly direction, through the grandest and most picturesque tracts of Sweden, and enters the Bothnia at Gefle. The Klar also rises in the same fells, but a little more to the south, flows through Wermland in a southerly direction for about thirty Swedish miles, and enters the Lake Wener at Carlstad. The outlet of the Wener is at Wenersborg, twelve Swedish miles to the south by the River Gotha, which runs down to Gothenburg, seven Swedish miles from Wenersborg. Thus the Klar River may be said to be forty-nine Swedish miles long, or the longest river in Sweden. The meadows both on the sides of the Gotha and the Wener, are, in some places, rich and fertile, but very liable to flooding. The country on the sides, and to the south of the Wener is well peopled.

The celebrated falls and sluices of Trollhätta are on the Gotha River, about six Swedish miles from Gothenburg. This fall is altogether 111 feet from top to bottom, but it is divided into several falls, its length being in all 600 fathoms. It is a grand fall, and owes quite as much to the romantic scenery which overhangs them, as to the magnitude of the falls themselves. The traveller on the steamboat has much to admire here, both in the natural grandeur of the falls and in the ingenuity of man as shown in the formation of the sluices, which run parrallel to them, in order to convey vessels from the bottom to Lake Wener above; with-

out these the navigation of the Wener would be entirely closed.

There is also a magnificent fall on the Dal River, called Elf Karleby. But here nature reigns paramount, and man has not yet interfered to surmount this obstruction. Except in the very north, however, the waterfalls on the Swedish rivers have little grandeur, and serve only as obstructions to the navigation.

It has been observed that the Swedish rivers are far less winding in their courses than those of other countries.

When we consider that the lakes and rivers occupy at least one-eighth part of the surface of the whole land, we are not surprised at the number of inland lakes which are met with here. In one parish of Norrland, there are said to be more lakes than days in the year. Many, however, are of inconsiderable size, but some—the Wener, Wetter, Mälar, Siljan—are magnificent sheets of water.

The Wener, which lies about 145 feet above the surface of the sea, is about fourteen Swedish miles long and seven broad, and covers an area of forty-eight Swedish square miles. Its greatest depth is 302 feet.

The next in size is the Wetter, which lies parallel to the Wener on the south-eastern coast. Its length is fifteen Swedish miles, its breadth four, and it covers an area of seventeen Swedish square miles. It is the deepest lake in Sweden, viz., 420 feet. The bottom of this lake is of a different formation to that of the Wener, and its fish and crustacea are very dissimilar.

The Mälar, on the east end of which Stockholm stands, is twelve Swedish miles long, eight and a half broad, and it is computed that 1300 little islands are scattered over its surface.

You scarcely ever see a gentleman's estate, especially in the middle or north of Sweden, where the dwelling house is not situated either near a river or a lake, which not only adds much to the beauty of the scenery, but is of no little value in the household economy, from the plentiful supply of fish which it provides. It is true, they are generally of

the coarser kinds, for trout and gwnynniad are confined to the larger lakes.

The Swedish monarchy is the oldest in Europe, for they date its foundation about 600 A.D., under its first king, Ingiald. The government is a limited monarchy; liberal without being in the least despotic; in fact the Swedes seem to enjoy perfect freedom, both in speech and press. All the four estates are represented in parliament, the representatives being chosen equally from the nobility, the clergy, the burghers, and the peasants. A reform in the representation is, however, now in contemplation. The present king, Charles XV., is, as he deserves to be, popular with all classes, and just the stamp of king to rule over such a nation as the Swedes. Simple and unaffected, firm but not overbearing, easily accessible, possessing talents of no mean order, of a manly, handsome personal appearance—he is a favourite with all classes, and I consider Sweden, just at the present time, one of the happiest countries in Europe.

Torn by no internal factions; troubled with no foreign possessions; governed by a king who appears to have his subjects' welfare at heart, and by laws which are just and equitable, without being unduly severe; without a foreign enemy; with an increasing commerce, and a country gradually, although slowly improving,—the Swedes may almost be said to live together like a happy family, and although they are poor in comparison with the inhabitants of other large European nations, I doubt if many a richer country might not well envy them.

The religion, which is strictly Lutheran, was introduced by Gustaf Vasa in the sixteenth century, and there appear to be no dissenters. It is true there are a few Catholics and Jews in the country, and a class called "Läsare," or readers, which seems to be much on the increase. These latter can hardly, however, be called dissenters, because I never heard that they wish to interfere with the standard religion of the country. These "Läsare," who are chiefly of the lower and middle classes, are simply rather stricter in the observance

of their Christian duties than their neighhours, in fact, rather more religious; and consequently, instead of being respected, as undoubtedly they ought to be, for setting a better example to their neighbours, they are universally sneered at, and "Oh, he's a Läsare" is used as a term of reproach.

The priests, take them as a class, are an exemplary, well-educated body of men, often over-worked but certainly not overpaid; zealous and indefatigable in their duties, and with perhaps as few pretensions as the clergy of any country in the world.

Their income, especially that of the curates, is small. A curate will probably not receive more than about £10 a year and his keep, and the first living to which he may be appointed will perhaps not exceed £40 a year. There are, however, some large livings; the largest I ever heard of, in Wermland, was about £800 a year, and I do not think there are any larger. The income of a Swedish priest is generally derived from a small farm, and often besides from a yearly payment of butter, corn, etc., by his parishioners.

One thing I much like as regards the appointing of the Swedish clergy. The priests are chosen by the voice of the parishioners (at least in certain cases) and the bishops by the vote of the clergy of the diocese.

The whole kingdom is divided into 12 stifts or dioceses, each under the rule of a bishop and consistorium.

The archbishop of Upsala is over all, and his income is about £1200 yearly, or less than that of the Bishop of Lund. The income of the Bishop of Lund is at present above £2000 a year, but a considerable reduction is about to take place, and in future he will receive scarcely £1000 a year, and the Bishop of Carlstad about £600.

These 12 dioceses are divided into 174 provostships, or contracts, of which the bishop of the diocese names the contract priest, who is the head of all the others in his provostship. The number of territorial "pastorats" is 1261, most of them including more than one parish. The number of all the clergy in Sweden, of every grade, appears to be 3406,

or one to about every 1000 of the inhabitants. In Norway the number is 500, or about one to 2500 inhabitants.

The church service is simple and well performed. There is much singing, but no ranting, and the men and women occupy different seats in the church. All parochial and other notices, such as notices of auctions, rewards for the recovery of lost and stolen goods, etc., are read from the pulpit after the service is over.

The Sunday is far better observed in general by the peasants than the higher classes, and certain Sundays in the year are held much more sacred than others. There are besides many holidays in the course of the year, on which no work is done. Christmas, Easter, and Midsummer, are very strictly observed. Holy Communion is a frequent observance with the Swedish peasants.

It is rather curious to the stranger here that the Lord's Day is supposed to begin at 6 p.m. on the Saturday night, and to end at 6 p.m. on the Sunday. The church bell tolls at six on the Saturday evening, when in general the peasants knock off work, and wash and clothe themselves for the Sunday, and as the religious duties of the Sunday are supposed to end at 6 p.m., it is no unusual thing to see a priest who has been preaching in church during the morning enjoying his social rubber of whist in the evening. Now if the Sunday really did begin at 6 p.m. on the Saturday and end at 6 p.m. on the Sunday, this would not appear strange, but still, if the early part of any one day is dedicated wholly to the service of the Lord, I think it but consistent that we should end the day in the same fashion, especially if it is the Sabbath; and I for one cannot think that a healthy, moral example is set to the lower classes of any land, where the richer ones invariably fix the evening of the Sunday for balls, concerts, entertainments in the theatres, and in their own houses, and the more especially as I could never see that the Saturday evening was in the least recognized as the commencement of the Sabbath.

I am not here going to play the hypocrite, for, as Burns observes, "God knows I'm not the thing I should be," but

I do think that we are all of us bound at least to spare one whole day out of the seven, if not altogether for religion, at least for rest and reflection, and as a slight mark of gratitude towards Him to whom we are indebted for all the good we enjoy in this life. I well recollect that even in "the bush," and on "the diggings," the Sunday was always at least a day of rest, if not of devotion; and although not probably one of us in a hundred had the opportunity of attending a place of worship, still the early lessons of an English home were never entirely forgotten, and even the bush tent wore a quieter and a different aspect on the Lord's Day. Probably a clean shirt and a cleaner face might be the principal outward observances of the bushman's Sabbath, and the Sunday was hailed by most of us as a day of rest from our weekly toil, in the true sense of the word. But still the Sunday was as much Sunday in the bush tent, as in the quiet village cottage at home, and the calm stillness of the day was not altogether without its fruits, for it carried the wanderer's mind back to the scenes of childhood and home, and opened once again the only page of life's history which could be said to be without a blot. It would be hard to say what thoughts were passing through the mind of the rough bushman as he lounged upon his rude bed in the full enjoyment of his Sunday's rest and a short black pipe; but I will venture to say that in nine cases out of ten, if his mind's tablets could have been laid bare at that moment, a small village church and perhaps a grey-haired parent, or a little sister with her hand fondly clasped in his own as he led her up to the old grey porch, would have been found engraven there in characters too indelible, for the rude waves of the stormy sea of life ever to obliterate. "The sound of the church-going bell" had, however, never broken the deep solitude of the forest in which his tent is now pitched. His mates might be engaged in some of the necessary occupations of every-day life. One might be washing a shirt, another cooking dinner, while others might perhaps be seated in careless conversation round the camp fire. But there was even still a something

in this wild spot which told that this day was different to any other. The loud laugh and the coarse jest which too often garnishes the ordinary discourse of the bushman, were seldom heard on the Sunday; or if one more hardened than his comrades attempted it, his mates would be more ready to turn away than to laugh. But all over the continent the Sabbath is regarded as a day of pleasure, and not of sacred rest; and although individually there may be quite as good foreigners as Englishmen, the moral tone of the inhabitants, generally speaking, of every foreign land which I have visited, is very, very different from that of old England.

You never hear in Sweden, as you do in England, or in many continental countries, a merry peal of bells. Some of the bells in the town churches are deep and finely-toned, but their measured, solemn toll, always struck a chill into my heart, for I never could make out whether they were tolling for church service or for a burial. The deep solemn sound of the church bell in the north, is in perfect unison with the stern, rugged features of the country, just as the sweet chime from a little English country church, is in keeping with the quiet rural scenery which usually surrounds it.

It is now many years (although I have never forgotten the time) since I sat on the garden terrace of the old house at home, in the calm twilight of the summer evening, and listened to the soft, sweet peal of bells from the tall spire of a neighbouring church, as the sound came floating down the river, mellowed by the water, and the stillness which then reigned over all.

Strange to say in all my wanderings since, I have only once heard a peal of bells which to my fancy could equal them, and this was of all places in the world, at Melbourne, Victoria. The gold fever was just then at its height, and the town was one continual scene of riot, and dissipation. I was then a "new chum," and like many others being out of luck, I had but little heart to join in the boisterous revelry with which I was surrounded. It was a lovely evening, and I had strolled about two miles from the town on the banks of the Yarra, to moralize, like the sentimental Jaques, upon my

future prospects. My heart was sad enough just at that moment, when suddenly the bells from some church in the town struck up a merry peal, so like my old favourites, that in a moment all my cares vanished, I quite forgot that I was a penniless adventurer in a gold-digging country at the antipodes, and every other reflection was absorbed in the remembrance of

> "Youth and home, and that sweet time
> When *last* I heard the evening chime."

The two universities are at Lund and Upsala. The former has about 600 students, the latter double that number. At both they have first-rate professors, and the system of education is very good. From the appearance of the students, I infer they are admitted at an earlier age than in our universities. Their university costume is much neater than ours, consisting of a plain dress, without a gown, and a jaunty little white velvet cap, with a yellow and blue rosette. The expenses of a university education are much cheaper here than in England. A young student told me that at Lund, about £3, and at Upsala, about £4 per month, would cover all expenses.

There are excellent schools in every town, but to this subject I shall recur hereafter.

Every Swede must read with the priest before he or she can be admitted to the Lord's Table; and every year the priest has to hold a meeting in various parts of his parish, and hear his parishioners read, and examine them in their religion. The peasants here appear to be much more under the eye of their clergymen than in England.

It appears from the prison returns in 1858, that out of 100 prisoners eight could neither read nor write; eighty-one could read; nine could both read and write well; and one was of superior education. It is quite certain that the lower classes in Sweden generally stand far before those of England, as far as education is concerned. In 1859, out of all the children of an age to be put to school in Sweden, only one in seventy was uneducated.

One thing I like much. You rarely enter a peasant's house without seeing a large Bible lying on the table. I recollect, once having an argument with an old peasant who was very poor, on something which happened in the Mosaic age. The poor old fellow said if he had only a Bible he should feel so much interested in the accounts of the earlier days. He had a New Testament, but had never been able to save money enough to buy a Bible. I asked him which he would rather have, an old pair of boots I had promised him, or a large type Bible. He hesitated, for his feet were "very near the ground," but he chose the Bible. I gave him both, and when I paid him a visit afterwards, I found him deep in the wars of the Philistines, spelling his way with the aid of a pair of monstrous spectacles made out of window glass. I met the old fellow about a year afterwards and he slily drew me into a discussion on the comparative merits of David and Saul, just to prove to me that he had read my Bible.

On the whole we may take the peasants throughout the country as a very good, sterling, simple-minded, contented, race of men. Honest, civil, well-behaved, and particularly willing to help a stranger. We rarely bolt a door at night in the country, and I never had a row with a peasant the whole time I was in Sweden. Murders or highway robberies are not often heard of, although both in Stockholm and Gothenburg I have seen some most villanous-looking scoundrels hanging about, whom I should be very sorry to meet on a dark night without my revolver.

Crime, they say, is on the decrease, owing, as some will have it, to the greater difficulty of procuring spirits; others (myself among the number) to the increased severity of prison discipline.

The punishment for crimes in Sweden is very severe. For a theft, the prisoner is doomed to pay a certain sum, probably double the value of the goods stolen, and in default of paying, to be kept on bread and water for so many days, and after that to be kept at hard labour for a certain time. I noticed that a thief who had broken into the Bishop's house at Lund, in the end of 1863, was doomed to be kept

to hard labour for the term of his natural life, and the receiver who bought some of the stolen silver, was sentenced to pay 3679 rqr., or in default, to undergo twenty-eight days bread-and-water, and after that to be kept to hard labour for one year and six months. This bread-and-water system, I am told, is no joke; they say twenty-eight days is almost equal to a death's doom. I believe the bread is unfermented, and without salt.

The solitary, silent system is strictly observed in the jails. Flogging is, happily, now abolished, and when an execution takes place, the axe is the instrument of death.

A Swedish flogging must have been terrible. The executioner did not use a "cat," but three long hazel twigs, which he cast away after every two strokes, and took three fresh ones. About twenty-four pair of strokes was considered as much as a man could bear. How is it then, that when the disgusting and brutal practice of flogging in the British army was at its height, a soldier could take 500 lashes from a nine-tailed cat?

Executions are rare. I read of one in Norway, in March, 1864, when two fellows were beheaded for a murder. The head executioner there, or "skarp rattän" as he is called, would be a very good mate for our old Calcraft, as he is sixty-nine years old, and has been in office above thirty years; during this time, however, he has only beheaded fourteen men and one woman; he only works in Norway, not in Sweden. The axe he uses is described as being quite an interesting relict; it did duty in Copenhagen in 1772, and has, I believe, been an heirloom in the old man's family ever since. It weighs seventeen pounds. How I should like to steal it, to place in my collection of curiosities!

In most parishes there is, I believe, a place set apart for executions, generally a lone spot at a little distance from the town. Formerly the heads of criminals were stuck on poles and set up where they were beheaded. Now, I believe, this is not the custom.

In Stockholm, two men were lately beheaded for a

murder, and if the public papers speak the feelings of the people, in all probability this will be about the last capital punishment in Sweden. At the last meeting of the "diet," a very great attempt was made to do away with capital punishment, and, singular to say, the priests stood alone as champions of the system.

Formerly a master could take the law into his own hands, and chastise his own servants, this, however, is not the case now, and an assault, especially on a policeman, is a very serious offence in Sweden.

I should certainly recommend the adoption of the Swedish prison discipline for our garotters. I have been told that they do not clip the prisoner close here, but as soon as he enters the prison they shave clean the one half of his head, leaving the hair on the other. This sort of head-dress must have an imposing and striking effect.

No one can be executed without first confessing the crime, even after having been condemned; but the prisoner is kept in prison till the confesson is made; and solitary confinement and the exhortations of the priest generally force the prisoner to confess sooner or later. Whether there is either justice or mercy in such a law I leave wiser heads than mine to determine.

The constables in the country are about on a par with our old parish constables at home, only, of course, fewer and further between. The new police in Gothenburg are a poor imitation of the London police; but it is a very heavy offence to interfere with them when on duty.

In the country towns, the night-watchmen cry the hours with loud sonorous voices, and one watchman, in Carlstad, was perched all night upon the top of the church tower to cry the hours through a loud horn, and give notice if a fire broke out in the night. I used to think a Swedish postillion must have roughish work of it during the winter, but his life would be a bed of roses compared to that of one of these steeple watchmen, on a cold January night, in the middle of Sweden.

Crimes, I believe, seldom go undetected, for justice, though slow in this country, is sure.

The total number of prisoners confined in all the prisons in the country, for offences of every kind, in 1862, was 10,055. This was rather more than in 1861, when the number was 9936; but less than 1835, by 1582 (or 13 per cent.); than 1845, by 5428; than 1855, by 2049; than 1860, by 1252.

Suicides are not so very uncommon, and in no other country have I heard of more real determined cases of *felo de se* than in this. Sometimes when a peasant drowns himself he sticks his hat or coat upon the bank of the river, so that his friends may know what has become of him.

There is not a regular coroner's inquest here in cases of murder or violent death, as in England; but the "lansman" has to view the body, and investigate the cause of death: There is, I may add, no "trial by jury" in the north, but in all cases, I believe, a final appeal to the king. In cases of *felo de se* a Christian burial is denied to the unfortunate deceased.

The civil laws are lenient. Bankruptcies and insolvencies are very common, and appear to be thought little of. It is very rarely that a man is imprisoned for debt, because his creditor must keep him during his imprisonment. Unless a man put his hand to paper, it appears to me that a debt will take almost any length of time to recover. I would warn the stranger, in any foreign country, to be very careful about signing his name to anything, especially bills. I only once put my name to a bill in Sweden, and this was to be joint security for a tailor, and I was done in so clever a manner that Sam Slick himself could not have beaten it. Two sureties were required for £25 for this man, to be paid in a twelvemonth, and I agreed to be one, on the distinct understanding that if the tailor did not pay, I could only be called upon to pay £12 10s., and my fellow-bondsman the other £12 10s.

The bill was properly drawn; I signed my name under

the tailor's, and my co-bondsman under mine; but there was a little space left between my name and his, and in this place they cleverly inserted a line to the effect that if *I* could not pay the whole £25 (in default of the tailor's doing so) *the other bondsman would pay his share.* Of course, the tailor never paid a shilling, and I had to pay the whole, or within a fortnight after the date of the bill all my things would have been seized. I had fortunately enough to pay. I was much vexed when I reflected that a man like myself, who had seen no little of horse-dealing and turf-life, should be so neatly done by a Swedish tailor.

Law expenses are very moderate in this country as compared with England. Nevertheless, as elsewhere, the lawyers appear to live and thrive.

There is no system of police espionage in this country, as in Russia. This sort of thing would not suit the free Swedes. There is no need of government spies, where a loyal feeling exists among all classes, nor does it require a very severe police, to keep a nation in order, who are all well disposed towards each other. Even if the country is a poor one, I would ten thousand times rather be the King of Sweden, and feel that I had not a real enemy among all my subjects, than be the Autocrat of a land like Russia, and know that those of my subjects who did not hate me, only feared me.

The strength of the standing army of Sweden in 1863, exclusive of officers, was as follows:—

Infantry.—Guards	1,800	
Of the line	24,000	
Conscription	70,950	
		96,750
Besides Gotland National Conscription, which, however, cannot be called on active service out of that island		8,500
Cavalry.—Guards	450	
Of the line	4,450	
Conscripts	3,700	
		8,600

Artillery (with 176 cannon)	5,050
Engineers	1,180
Train	4,676
Total . . .	124,756

Independent, however, of these troops, they have another corps the numerical strength of which I am unable to state, which in the event of an invasion would probably be of material assistance, but who belong neither to the contingent nor the reserve. Every young man in Sweden from twenty-one to twenty-five is liable to be called upon to serve as a soldier in case of invasion. He is drilled for two years, and for a short time on the parade-ground with the other soldiers.

The regular land-soldiers do not live in barracks (except the artillery in Gothenburg and the guards in Stockholm), but they are stationed all over the country. Every estate or hemman in Sweden, of which there are about 65,000, must support a soldier, *i. e.*, find him a house and little piece of land, do his ploughing for him, and pay him a certain amount of rye yearly. Some few estates are called "Satterier," and these, having been granted in former times to the possessors free of all taxes, have no soldiers to support. And in some few other cases a "hemman," instead of keeping a house and land for a soldier, pays a yearly tax of 90 rqr. to the crown. These soldiers are exercised or drilled once in every year, and this is the only time they can be said to be on soldier's duty, when they meet and camp out on some large plain. Most of them are married, live at home, and do labouring work for the rest of the year, except some few who are stationed in castles throughout the land.

By this plan the Swedish army is kept up at a small expense to the crown. All their arms and uniforms, when they are not on drill, are deposited here and there in large magazines.

The officers are also scattered over the country, many of them living on farms granted to them by government.

That the Swedish soldiers are strong, brave, and hardy men there can be little doubt, and probably in an intellectual and moral point of view stand higher than the common British soldier. In the case of an invasion, they would doubtless be very formidable opponents, for the country is well adapted to a guerilla war. But we must not shut our eyes to what is the real strength of an army constituted like theirs, comprising as it does men with families, men taken from their business or work, and who do not possess, like the soldiers of permanent and regular armies, the instruction or habits acquired in military life. Moreover, their cannons and muskets are quite of the old school, and would stand little chance against well-appointed batteries, manned with modern artillery, or regiments armed with the Whitworth rifle. We had a pretty good proof of the efficacy of well rifled cannons over old artillery in the late war between the Prussians and the Danes. Perhaps the only nation the Swedes have to fear are their neighbours the Russians; and I trust the day is very far distant when the old blue and yellow flag of Sweden will have to strike to Russia. Of all European countries, Sweden has apparently at the present day less need of a large standing army, and more need of an effective rifle force, than any other. She has no foreign possessions to protect, and she wishes to make no aggressions upon her neighbours; and as long as they will let her alone, I do not think she will ever meddle with them. Late events have, however, shown us that aggrandizement is now the aim of the larger continental states, and if, as it seems probable, Prussia and Russia are in league, Sweden may be said to stand between two fires, especially if the Prussians make further encroachments upon Denmark. National bravery will avail little against brute force and overwhelming numbers, but an effective rifle corps would do much in a land like Sweden. To be fore-warned is to be fore-armed, and I should strongly recommend the Swedish government to re-model their artillery and the small arms of their infantry, and to do all that lies in their power to encourage the movement of the volun-

teer rifle clubs. It is upon these latter that the safety of a country will much depend in case of an invasion. With a very little management and at a trifling expense, Sweden might have at her command 50,000 volunteer rifle men—men of good blood, in the prime of life, who if properly armed, and fighting in their own country, would be very little if at all inferior to the ordinary land soldiers.

It does not appear now to be England's policy to interfere with foreign quarrels; and whether it was foolish or wise in her not to assist Denmark in the late struggle, I am not politician enough to say. Whether or no she has lost her *prestige* among European powers by not doing so, I think matters very little. I do not consider that for many years England has had one really true friend in Europe. And there is not a European power who would not be sincerely glad to see her embroiled in a quarrel from which she could not extricate herself. No one but Englishmen who are living abroad can see with what jealousy, I may almost say hatred, England is regarded by nearly every foreign power, and it behoves her just now to be very careful how she casts the first stone. All I trust is, that she never will be *taunted* into fighting. But if it is once shown that it is her duty to fight, I for one feel pretty confident, notwithstanding all the sneers not only of foreigners but even of many of her own countrymen, that the good old British war-cry of "Heaven prosper the right," will be found to have lost none of its ancient meaning.

The Swedish fleet consists of 8 line-of-battle ships (2 steamers and 6 sailing vessels); 6 frigates (1 screw and 5 sailing ships); 6 brigs; 18 schooners; 88 gun sloops (consisting of 12 steamers and 76 sailing vessels); 6 small steamers; 112 gun boats (a very effective force on this rocky island-studded coast); 12 small transports. In all 24 steamers, 237 sailing vessels, with 1215 cannons.

The Norwegian army consists of—troops of the line, 19,511 men; land troops, 15,604 men. In all, 35,115 men.

The Norwegian navy consists of 146 ships, with 854 cannon.

The volunteer rifle movement is going on slowly in Sweden, and there is scarcely so much enthusiasm displayed in the cause as I should have fancied there would have been in a country so well adapted for sharp-shooters, and where the rifle is decidedly a favourite weapon.

The two naval depots are Stockholm and Carlskrona, and perhaps the best fortified sea-coast town is Marstrand. There is a military college, like Sandhurst, at Carlsberg, near Stockholm.

The Swedes make excellent sailors, and I have often heard English captains say that they like to have a Swede or two very much among their crew. Neither the wages or the living are so good on board the Swedish as on the British or American ships, and on this account so many Swedish sailors sail under these two flags. I fancy they prefer the American.

The annual expenses of the Swedish Government in 1860 amounted to 26,911,710 rix-dollars.

	rqr. rmt.
1. Head, or crown departments	1,278,400
2. Justiciary	2,198,570
3. Foreign	479,200
4. Land force	8,727,720
5. Naval	3,305,100
6. Civil department	2,206,950
7. Financial department	4,270,450
8. Ecclesiastical	3,276,400
9. Pensions	1,168,920
Total	26,911,710

Or about one and a half million English pounds.

This expenditure must, however, have increased during the last four years. In 1841 it amounted to little over 16,000,000 rix-dollars.

The taxes are light, indeed, in comparison to England.

Most of them seem to be charged upon the land, except a small income-tax. All these things are managed very well.

Each province has its governor, who resides in the country town, and each town its burgomaster. In every district is a "lansman," or head-magistrate, who is regarded by the peasants as little inferior to royalty itself.

Judges are appointed for each district, who hold a kind of district court or assize every spring and autumn at different places throughout the country for the trial of criminal and civil cases.

CHAPTER II.

General Description of Life in the Country—The Inhabitants—Expenses of Living, and Advice to the Traveller and Sportsman Visiting Sweden.

No passport is now required to any part of the north, and the traveller can visit Denmark, Sweden, or Norway with far less difficulty than he could ten years ago. There is little trouble at any of the custom-houses, and he is sure to meet with civility and assistance from every official.

If the English traveller wishes to reach Sweden direct, his best plan will be to come to Gothenburg by a steamer from London or Hull, which leaves both places every week during the summer for Gothenburg. Messrs. Phillips and Graves, Rood Lane, City, are the agents in London; Messrs. Wilson in Hull. The London boats are the cheapest, but in either the first class will not exceed £3 besides provisions on board. This is not much out of the way, but for dogs the case is different. A pointer was sent over to me by the Hull boat in 1863, and its fare was £1 1s. 7d. to Gothenburg. The same dog's fare from England to Australia, 14,000 miles, would have been £5. Small parcels are also exorbitantly dear by these steamers.

The length of passage is about the same from both places, say at longest, three days. The steamers will run nearly through the whole year, certainly from February to the middle of November. From Gothenburg the traveller can reach Stockholm at any time of the year in one day by rail, but in the summer I should certainly recommend him to go up by one of the little steamers over the Wener. The passage will probably occupy three days, but this will be amply repaid by the sight of the beautiful scenery through which

it passes. In fact, I know not a nicer nor cheaper summer for the English tourist than to come to Gothenburg and travel up to Stockholm in this manner. He will not require a guide an inch of the way as all the captains on these boats speak English.

There are no real English hotels in Gothenburg or Stockholm, but in most there is a courier who speaks English. Living in a hotel at either place will be about as dear as in a second-rate London hotel. Blom's hotel and the Gotha Källan are perhaps the best in Gothenburg; Hotel Rydberg in Stockholm.

I should decidedly recommend any Englishman (especially a sportsman) landing in Gothenburg, if he want any advice or assistance, at once to call upon my old friend, Mr. Duff, British Vice-Consul, a first-rate sportsman himself, and who is always willing to help an English traveller.

The English traveller who lands in a foreign country with a good letter of credit in his pocket will find little difficulty in getting on, and if he is only visiting Sweden for the purpose of seeing the country, and of obtaining a little chance fishing and shooting at any place where he may stop, he had better hire a travelling servant in Gothenburg who speaks English (at 3s. 6d. per day and his keep), and when once in leading strings, leave all to his guide. He will see the country in this manner, and I dare say obtain a little sporting whenever he chooses to pull up. But as this book is intended for a guide to the English sportsman whose means are too limited to obtain him good sport in England, and, therefore, seeks a new field where he may be able to enjoy a little sport and yet live cheaply and comfortably for a length of time, I shall endeavour to point out to such a one the cheapest and best way to go to work in settling up the country where fair sport is to be had, and where he may live at a moderate expense; and in a future chapter, I shall enter more fully into the fishing and shooting of this country, telling him exactly what sport he may expect to find, what localities are best to seek it in; and if he only follows my advice, I do not fancy he will be altogether disappointed.

But before visiting Sweden, he must make up his mind to moderate sport and to work hard for that. Considering the wild nature of the country except right up in Lapland (and my "Spring and Summer in Lapland" will tell him all about the fauna and sporting capabilities of that land), Sweden is very badly stocked with game, and this is solely owing to the game laws being treated quite as nonentities, and there being no regular gamekeepers to look after the game, except just in the duck and snipe season. I never made what I call a *heavy bag* in the country, others, however, I know have done much more than myself.

I will then suppose a man to have landed in Gothenburg without a friend, and without knowing a word of the language. If he is a married man, and thinks of eventually settling, let him by all means leave his wife and family at home till he has taken one trip over by himself to reconnoitre the land. He will get on well enough in Gothenburg, where about every third man speaks English, nor will he require any assistance till he comes right up into the country. It will be very little use for him to remain in Gothenburg, where living is as dear as in England, and very little sport to be obtained at the present day, except by the residents who have now all the shooting in their own hands, and are exceedingly jealous of strangers. There is very little trout fishing in the south of Sweden, and there are only two or three salmon streams along the whole range of the southern and south-eastern coast, and it is quite as difficult to get leave to fish them as in England, so don't let the English traveller fancy that he will be able to procure salmon fishing in every part of Sweden. I refer him to my chapter on Swedish sporting for further information on this point. There certainly used to be, and perhaps, at times, still is, fair duck and snipe shooting in the Gothenburg reed beds, but now the shooting there is very strictly preserved by a kind of club; besides, when an Englishman leaves home he does not travel to meet Englishmen; and I think no town so undesirable a residence for an Englishman as a second-rate foreign one, where English customs

and manners are universally aped, and English prices charged for foreign produce. Nothing but English goes down in Gothenburg, and they tell a good story of a Gothenburg swell who went into a coffee room there and ordered a real English dinner. He must have real English beef-steaks, real English porter, in fact he so bothered the girl with his English orders, that at length she asked him whether she was also to bring him English salt; the name by which our epsom salts are known in Sweden.

The man who only visits Gothenburg has seen very little of Sweden. The Swedes he meets with are spoiled by the number of English whom they see in this little seaport, and the few English who are resident there will be of little or no use in introducing him, either to the sporting or natural history of this fine land, and the scenery around the town, although pretty, is scarcely Swedish; so if he wants to see real Swedish scenery, real old fashioned Swedish customs, and enjoy a little fair sporting at a moderate price, he must shake the dust off his shoes at the good town of Gothenburg, and steam up to the Wener at once; and if he means to stay any length of time in Sweden, let him take up his quarters in Carlstad for a few months, till he has become acquainted with the language and customs of the people. He can live cheaper here than in Gothenburg, and he will be able to obtain some very fair sporting round the town. It is not the least use a man thinking of settling in the country where any sport is to be had till he has learned something of the language, and let him settle where he will at first, until he knows the language and customs of the people, his living will cost him 100 per cent. more than when he has become used to the country. An Englishman therefore who visits Sweden for a short time cannot give any opinion as to whether it is a cheap country or not.

But I may as well here say that Sweden is not so cheap a country after all as we in England suppose, and I believe a man with a family who is used to and cannot do without English comforts, will be able to live very nearly, if not as cheaply, in England. But for a single man, who

does not mind roughing it, and can make himself tolerably comfortable in peasants' quarters, after he has once mastered a little of the language, and got a footing in the country, and who wishes to enjoy a little fair fishing and shooting, Sweden is certainly a cheap country in some respects, and after all a good deal freer than any part of England. Such a man ought to live well on £50 per year, and get some very tolerable sporting, but he must then hire his own room and buy his own provisions. There are many places where a single man can board with a gentleman's family at about two shillings a day, with a peasant for a little less, and till he gets used to the country, this will be, perhaps, his cheapest plan. But a man with a family will find it very difficult to get settled. I am certain he will have great difficulty in finding accommodation, and that such a man must reside for some time in a town at English prices, and probably at an inn, before he can settle up country. Very few residents have furnished rooms to let, and although a single man may obtain quarters any where, it will be very difficult for a man with a family. A gentleman with his wife and two small children and nurse-maid could not get board and lodging any where in Wermland under ten shillings a day; and this very gentleman who had come over from Belgium, said that with his family he could live there far cheaper than in Sweden, and much more comfortably, inasmuch that one franc, of which he got about twenty-five for the English pound, would go as far as the rix-dollar in Sweden, of which he got about seventeen for the pound. But if he hires his own little place and takes Swedish servants, and buys his own provisions, he may certainly do it for less; but this he can't think about until he has been at least six months in the country.

I have tried different plans. I have lived with gentlemen and with peasants, and I have hired my own room, and bought my own provisions. The latter was by far the most independent but the dearest plan, for I was never a very good economist. If a man really means to settle, he had far better hire a small place, with a few acres of ground,

and farm a little. He must at all events have a housekeeper, and a man to row him and help him in his shooting excursions, and he may just as well employ their spare time usefully as not. But if he can fall in with a gentleman or respectable peasant in a good district, who will board and lodge him for about 1s. 6d. a day at first (and such a place a single man will be able to get), I am sure he will find this his cheapest plan. There will be one great advantage in this plan, it will give him a sort of standing and introduction into the country, while he is acquiring the language, and if he only gets himself liked, which he can easily do if he behaves civilly and courteously to the gentlemen, and liberally to the peasants, he will find no difficulty in getting on.

It is not easy to recommend the choice of a locality for a man whose sole object is sporting. The best partridge shooting is in the south of Sweden, and we had none in Wermland, where I spent the most of my time. Perhaps, also, the best open black game and woodcock shooting is in the south; but I fancy a stranger will now find some difficulty in obtaining sport there, as most of the proprietors fish and shoot themselves. Duck and snipe shooting can be met with throughout the whole country in good localities.

But in Wermland, if a man is only settled in a good locality, he will meet with every kind of game peculiar to Sweden (before the severe winter of 1860 cut them all off, we had excellent partridge shooting in the south of the province), and in many places, especially towards the north, very good trout and grayling fishing, and even lake trout, besides nearly every other kind of fish which is met with in the southern waters. I speak of this province from experience. I made many good friends there, and I am certain any other Englishman can do the same. He will here find the gentlemen kind and courteous, the peasants civil, and willing to oblige, and besides this (which is now far from being the case in the south of Sweden), he will have no difficulty in obtaining sport if he only bears in mind

these two golden rules—never to set foot on any man's land, even the meanest peasant's, without first asking leave; and, above all, to avoid getting the name of a *pot-hunter*. If he has a day's shooting or fishing on a gentleman's ground, let him leave a good share of his game behind him, and a few rix-dollars and a glass or two of brandy will obtain him the free run of any peasant's land. As for fishing, he will have little difficulty in obtaining leave to fish as much as he pleases on any water in Wermland with a *rod and line*; but there is no real salmon fishing anywhere inland; and as for the matter of shooting, there will be many wild tracts where he can wander for miles without any one asking him where he is going.

Of course he must hire a man to row him, and accompany him in his forest ramblos—in fact, as a general rough servant. Such a man he will get for about 1s. 3d. per day in the summer, and he must buy a boat for his fishing. A boat will cost him nearly £1, a punt 12s. If he wishes to travel about (and as soon as he becomes known to the neighbouring landowners he will have lots of invitations, for Wermland is one of the most hospitable provinces in all Sweden), he can always obtain a peasant's horse and cart for 1s. 2d. the Swedish mile, to take him where he wants. His dogs he must feed entirely on oatmeal and milk, and about £1 10s. a year will keep each dog well, and if he reads further on, he will see at what price, and in what manner he can feed himself.

It would be far the best for any man who really wishes to spend two summers and one winter in Sweden, and to give the country a fair trial, to come up to Carlstad in May, as soon as there is open water, and live there till the season sets in, when he must look out for better quarters, and this he will have to leave much to chance. Here he must, of course, take lessons in Swedish, and spend his whole time in mastering the language. I always found Carlstad a very nice and pretty summer residence, and the people very kind, and it is certainly cheaper than Gothenburg. I may add, that a good many people here speak English, and I know no town

in Sweden where they are more anxious to learn, and I am certain a well educated young Englishman could get an excellent living by teaching English. He would make far more money and be far more independent than many a poor curate at home, and thus gain an introduction into the best families.

If he wants real wild Swedish sporting, he had better, when he moves, go right up into Dalecarlia, and the nearer he camps to the dividing fell range between Sweden and Norway the better. But in every part of Wermland he will get wild forest shooting. I have heard Trysell, on the Norwegian frontier, well spoken of, but I fancy anywhere about twenty-five or thirty Swedish miles north of Carlstad, would bring a man into the wildest forest districts; and I should recommend him to be somewhere near the fells. I know the river Klar for quite twenty miles up, and I was much disappointed in both the fishing and shooting there, for I was not near enough to the real fells, and none of the great lake trout seem to come far up that river. Probably they are all stopped by the fall at Degerforss, about a couple of Swedish miles north of Carlstad, where great numbers are taken every year in the salmon-trap. Strange to say, I found very few willow grouse up there, although they come much further south; in fact, very little of any kind of game on the banks of that river. Bear shooting, as well as elk, is to be obtained within about seventy English miles north of Carlstad.

His English money he had better leave with Mr. Duff, in Gothenburg, to whom all his remittances could be made. That gentleman could send him Swedish money when he required it. Whatever part he settled in, there would always be a town or iron manufactory in the neighbourhood to which his letters could be sent from Carlstad, and this he must arrange with the postmaster there.

He will of course bring *all* his English clothes and tackle with him, and let his outfit be good. Just what he has used at home will do here. A rifle will be of very little use to him, for in bear and elk shooting, I think a smooth-bore

will answer every purpose; unless, indeed, he means to try reindeer stalking on the fells, and then, of course, his rifle will be indispensable. A pea-rifle would, however, be very handy for shooting blackcock and capercaillie in the winter if a man knows how to use it. He had better bring over plenty of English powder and caps, for these he cannot get up country. He can buy plenty of powder (but it will not be so clean and strong as the English) for about 2s. a pound. I never saw any caps in use up the country, except the common German rubbish. Very good shot he can buy anywhere, and his best plan will be to procure 1 cwt. at a time from the manufactory of Skröder and Arpi, at Guldsmedhyttan. He can order this in Carlstad, and it will be sent to him packed in 5 lb. packages in a strong box. The Swedish numbers, unlike the English, run up from 00, 01, 2, etc. to 14, which latter number is the size of a small pistol bullet. The best sizes I can recommend are—1 for snipe and woodcocks, 3 for ducks, black game, etc., 5 for hares and capercaillie, and one packet (5 lb.) of 10 or 11, in case of a shot at a lynx or wolf. He can also buy bullets of all sizes, and the best powder that I have met with in Sweden, from the same manufactory. By purchasing it in this way his shot will cost him under 3d. per pound.

I recommend a good strong tweed shooting coat and trousers for all seasons and purposes, and if he should want any warmer winter clothing, which he will if he comes to winter in North Wermland, he will get it in the country better than at home, and a few English books of light reading will prove a great solace in many a long winter evening.

The best dog for all purposes will be a hardy, general purpose setter, which will take the water and retrieve. This will do for all game in the open; a pointer will hardly stand the climate up here. I imagine a heavy close-hunting Sussex spaniel would be very useful in the forests, but for general work in these deep woodlands, where the dog springs the game, and when it perches stands barking under the hill till the shooter creeps up and shoots it sitting, I know no dog except such as they use here. These are only to be pro-

cured in the country, and such a dog well broken to drive hares and tree capercaillie or black game, will cost from £4 to £5.

Before he starts for Sweden let him make up his mind to be content with fair, moderate sport; this he will be sure to get. I dwell much on this point because many sportsmen who write to me from England for information, seem to have formed very erroneous ideas of sporting in Sweden.

Let him when once settled in the country lay aside his English hauteur and exclusiveness, treat the gentlemen with courtesy, never trespass (he will scarcely ever be denied if he asks leave), and let him act with kindness and hearty freedom and liberality towards the peasants; he will soon then become a favourite with all classes, and after he has once got a good name and a good footing, it will be his own fault if he cannot keep it. Recollect that all will depend upon the first footing he gains in the country, and above all never to be stingy in trifles with the peasants. Never grumble uselessly nor give unnecessary trouble. The peasants are very slow, and must not be put out of their way.

I never in Wermland heard of any one renting shooting. I have always been lucky enough myself to obtain as much of both fishing and shooting as I wanted, through the kindness of the neighbouring gentry and peasants, but I daresay a tract of forest land could easily be hired for a trifle, and, no doubt, if this was really well looked after, a good head of game might soon be got up. I know fishing is often let for a certain share of the fish. But I always had an objection to renting either the exclusive right of fishing or shooting in a foreign country. Such a plan is very apt to bring a man into collision and unpleasantness with his neigbhours; it is far better to obtain leave to fish or shoot when you please, and either pay a small sum or give up part of the fish or game, and have no trouble with preserving. Of course, if a man purchased an estate, it would be a different matter. As I have before stated, sporting was a secondary consideration with me, and I did not require to be settled in a particularly good sporting district, especially as I was away from home six

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months out of the twelve, collecting. So all I wanted was a home to come to, where I could leave my books and things in safety when I was absent; in fact, where I could have head-quarters to arrange my collections, put together my notes, etc.; and I was lucky enough to find just the place I wanted, at Gardsjo, South Wermland, with my old friend, Q. E. Stenstrom. My mode of living and expenses, were as follows, and in any part of Wermland I have no doubt an Englishman, when he was used to the country, could live in the same manner, and probably get much better sport than I had.

I paid about £3 yearly for my room, and if I had liked to have gone into farming, I could have hired some land as well, and the whole house pretty cheap, and by laying out a little I could have made it a very nice summer residence. But I was always longing to get back to the Australian bush, and could never make up my mind to settle. I was surrounded by birch woods with a lake of about 100 acres full of pike and perch in front of me. I paid Mr. Stenstrom's gardener's wife, who lived in the same house, about £3 a year to "do for me," and gave her coffee, which came to quite as much as her wages (and, I may add, that it is wonderful how fond these peasant women are of coffee). I might have easily hired a proper housekeeper, but this would have probably been much more expensive.

My collecting lads I paid by the piece, and if I wanted a man to row me for fishing or shooting, I had no trouble in getting one.

My firing I got very cheap, for little more than the cost of cutting. I bought the whole of my household furniture, beds, tables, chairs, linen, crockery, cooking utensils, at an auction for a little more than £8. A few good English sporting pictures, racing, steeple-chasing, boxing, and rowing, just to show them here how we do it in England, made the walls of my room quite smart, and a library on natural history, etc., such as few British naturalists could beat, filled my book-shelves. My little cabin was quite a show place for the neighbouring peasants, and it was a

treat to hear their remarks on my pictures. Old "Peter Crawley" in private dress was taken by all for a respectable Swedish "bruckspatzon," and a peasant once asked me if young John Day on the "Hero" was not our king, for he never saw so grand a horse and rider in his life before. As for my books, it was quite a mystery to the peasants what I wanted them for, and as for my collecting tastes, I believe I was looked upon by one and all as a harmless monomaniac. I got my post twice a week from Carlstad, and the "Field" and "Bell's Life" kept me informed of what was going on in England. My guns, rifle, fishing-rods, hung round the walls, and if any brother sportsman could have travelled up blind-fold, and opened his eyes in my little cabin, he would hardly have believed that he was in the wilds of the Swedish forests.

I insured all my goods and chattels for about £300, at the yearly rate of 6s. I paid a small tax of 3s. each for my dogs, but this is not done in all districts, and as I paid no other tax, although I believe, strictly speaking, I ought to have paid a small income-tax, I used to give away every Christmas a few quarters of rye to the poor people in the neighbourhood, and I always reckoned that this little investment brought me far better interest than I could have possibly obtained anywhere else for my money, because I had in return the blessings of the poor and needy. I never could see that in my neighbourhood any profuse liberality was expected from me because I was an Englishman, nor that any attempt was made to impose upon me on this account, at least, if so, it was too trifling to be worthy of notice. I certainly never yet saw a country where small favours are so thankfully received, especially among the poorer classes, and it is really wonderful what an immense deal of real charity a man has it in his power to do (and at a trifling expense) in a country district, and depend upon it it will not be without its return.

Wood is universally used for firing here in iron stoves, and when the ashes are burnt down, the chimney of the stove is closed to drive the hot air into the room. By this means

and with double windows, the rooms are kept warm in winter. These stoves are rather dangerous to manage, if you are not accustomed to them, for the fumes of charcoal may soon cost a man his life. Considering that all these cottages are built of wood, and how very careless the peasants are with their fires, it is really wonderful that they are not oftener burnt down.

As to my living, I could live exactly the same as in England, if I chose to go to the expense, save that the meat (except the mutton) was not so good. The bread in the country is made of hard rye, in thin cakes as large as a plate. This is hung up, and will keep any length of time. In some large houses they bake only twice in the year; but they can also make just as good light wheat bread as in England.

The usual fashion of living in the Swedish gentlemen's houses is—coffee in bed about six (this custom, which I think one of the very best in Sweden, is now being laid aside); breakfast about nine; dinner about one (after a dram and a little bread and butter); a cup of coffee, and half an hour's nap; a little snack about five, and supper at eight. In the summer every one in Sweden is very early, and the short Swedish summer may almost be said to be spent out of doors.

The prices of provisions in my district were, in 1864, as follows:—

Mutton	4*d.* per lb.
Beef	3*d.* per lb.
Pork	4*d.* per lb.
Rye meal	2*s.* for 20 lb.
Wheat flour	3*s.* for 20 lb.
Oatmeal	1*s.* for 20 lb.
Eggs	7*d.* in summer, 1*s.* 2*d.* in winter, per score.
Chickens	9*d.* each.
Hares	1*s.* each.
Capercaillie cocks	2*s.* 3*d.* each.
Capercaillie hens	1*s.* 7*d.* each.

Wild ducks . .	6*d.* each.
Black game . .	1*s.* 6*d.* per brace.
Hazel grouse . .	1*s.* per brace.
Potatoes, about .	1*s.* 2*d.* per English bushel.
Tobacco . . .	1*s.* 6*d.* to 2*s.* per lb.
Beer . . .	3*d.* per bottle.
Porter . . .	6*d.* per bottle.
Coffee . . .	9*d.* per lb.
White sugar . .	7*d.* per lb.
Butter . . .	7*d.* to 1*s.* per lb.
Milk (new) . . .	4*d.* per kanna.
Pike and perch .	2*d.* per lb.

Clothes of all kind (except, perhaps, shoes and boots) are much dearer than in England. We had a shop close to us, and a shoemaker and tailor on the premises. It is wonderful how many dependents a Swedish estate owner has about him. On the Gardsjo estate alone there were above 120 men, women, and children.

I never in my life fell among kinder people in sickness than the Swedes. I have been pretty lucky, and I cannot sufficiently thank God that, in a wandering life, I have had so little sickness. But three or four times I have been rather seriously ill here, and then the kindness and sympathy I received from all classes was past belief. As for the peasant women who nursed me, no trouble was too great for them, and there was really something beautiful in the kind attentive way in which they waited upon me, and, above all, the cheerful manner in which they anticipated all my querulous wants. The doctors are in general very clever. In the country, a doctor is stationed in every district. He receives a little stipend from Government, and each family pays him a small sum a year, say £2 10s. (and for an accident or serious illness there are cheap and excellent hospitals in every town). This is exclusive of medicines, for doctors rarely dispense here. They write a prescription, which is sent to an apothecary to compound. These chemists appear to have quite a monopoly, and as there is never more

than one in each small town, they appear to charge very high.

Most country houses, however, are well supplied with common medicines, and as all the ordinary ailments are pretty well understood, the doctor is only called in, in extreme cases. The principal sicknesses here are low fevers, colds, agues, and diarrhœa.

Bleeding is a universal panacea with the northern peasants. They even bleed for the ague. This ague is a horrid complaint, and if caught in the autumn is sure to stick to a man through the winter. The strongest are not proof against it, and when once in the frame I fancy it always sticks to a man. Consumptions are not uncommon. Diarrhœa is very prevalent. The best cure I know is a handful of peppercorns washed down with a glass of brandy. The peasants here adopt an excellent plan. They all wear long leather aprons, like blacksmiths, which cover the breast and reach to the knees. The great thing is to keep the stomach warm in winter, and I would always recommend the stranger who is much exposed to the weather here to wrap a shawl or flannel round his body under his clothes.

The principal peasant doctors are old women, who cup, bleed, and blister, most scientifically. These old women are also the licensed midwives of the district, and rarely is a doctor called in, in a case of labour.

I fancy there is something in this climate very prejudicial to the eyes, at least one sees such numbers of men (often very young ones) who wear spectacles; and I do not know whether it arises from the heat of the stomach or from the quantity of sugar which is eaten, but I have seen a great many pretty faces spoiled by the total loss and decay of the teeth. We had very nice neighbours round us, and if I had chosen, I need not have been at home half the winter.

Although the shooting could not be called first-rate, we had capercaillie, hares, black game, and hazel grouse, in all the forests. Plenty of ducks and snipe in the season, in the grass, in the meadows, and in the rushes by the side of

the Wener. I don't know that I ever enjoyed myself more than I used to do in August and September, when I would make little trips, with my old man in my punt, on to the lake. We used to take our provisions with us, and our fishing and shooting tackle, and camp out, and cook our meals on one of the little islands which stud the lake. It was not so much the sport I cared about, as the pleasure I used to feel in wandering free and unmolested among such beautiful scenery. I used, however, to pick up a good many birds, and, in 1863, I bagged above 200 couple of ducks and snipe, principally the former, close round us, and I was not out thirty times. I could go pretty well where I pleased, for every one around was kind and civil, and I had shooting, such as it was, over far more ground than ever I cared to walk over.

The only fish we used to get around us, were pike, perch, and roach, pike-perch (or gös), jack, bream, and the commoner fresh-water fish. We had no salmon-trout near us, although many places in the Wener abound in them, and about three miles north-west we had some very fair little trout-streams, and two lakes full of charr, up to 5 lb. weight, and even larger.

I passed a very happy life, because I had plenty to do with my collecting, else the time would have often hung very heavy on my hands in the winter, for at this time there is little or nothing to be done in these forests. If a man is ever so keen a sportsman, he is of necessity kept a prisoner by the weather many days in doors, when he cannot get out at all for the snow; and moreover if he could get into the forests at this season, they appear to be quite deserted. I never could fancy where all the forest game is at this season. In England the shooter reckons on his best and most varied bags in the winter. In Sweden the season for game may be said to close in November, for then all the ducks, snipe, and woodcocks have left us. The game birds which remain in the forest I believe all sit quiet in the trees, where no dog can find them; and except an odd fox (for we

shoot them here), a martin, cat, or a hare, there is little winter shooting in South Wermland.

In fact I cannot deny that life in a bush cottage in the wilds of Sweden during the long Swedish winter is a dreary, monotonous existence. I was very well off, but a man whose sole object is sporting would not have my resources. My time, as I said before, was fully occupied. I had an excellent library to turn to (and the old author was not far wrong who declared that of all men most to be pitied were "unlearned gentlemen on a rainy day"), and I had my collections to arrange and look after. Moreover I had my landlord, who spoke English as well as myself, close at hand, and whenever I wanted a change I ran into Carlstad, or drove over to spend a few days with some friend or other in the neighbourhood, whose doors were always open to me. But most likely if a man were settled up in the real wilds, where the best sport is to be obtained, he would not have many neighbours within calling distance, and would probably meet no one who could speak English. Even if his sole object were bear-hunting, he could not always be in the forest; in fact, the few bears he might kill would not occupy a great deal of his time, and many a dreary week would hang heavily on his hands. Of course if a man had his wife and family with him, and were living on his own little estate, the case would be very different, but I am here particularly addressing myself to the bachelor sportsman, and to him I will candidly say I do not believe in any part of the north of Sweden, he would find sport enough to compensate him for the lonely solitary life he must lead during the winter in these forests. I have had my share of it. I have also spent five years in the Australian bush. But I never found *that* life lonely. We all know what an effect the outer landscape and climate has upon the spirits, and to be shut up in a bush hut for five or six months gazing upon a dreary prospect of snow and pines, with little employment, would wear many a man out. But when once the spring sets in, the case is different, and the proper arrangement in these northern forests for the man whose sole object is sporting,

should be that he could sleep from November to March, wake up about April, and never sleep again till November came round.

To enjoy Sweden thoroughly, a man should visit the country early in May, and leave it in the end of October, and I will safely say that if two comrades hired a little cottage up in a good district in North Wermland, spent the season there, and returned to England every winter, they could enjoy themselves as much as any two men in the world, and get some capital sporting. The difference in the expense of this, and spending the winter here, would be little more than the cost of the journey to England and back. They would leave their cottage and *all their traps* very safely in charge of a peasant, and although they would not enjoy that "social distinction" which the renting of a Scottish moor (according to the editor of the "Saturday Review") confers upon a man, they would have some rattling good sport, and the sportsman with about £100 a year would very probably at the end of the season be able to compare books with the rich English grouse-shooter, who had paid £200 a year for the mere rent of his moor. But the Saturday Reviewer was not altogether wrong, for let the sport be what it may in a foreign land, it will always want the charm of home association to complete it. And although I have killed more snipe in one day in the north of Europe than I could perhaps bag in England in a week, and more wild fowl in one night's flight-shooting in Australia than I could well carry home, I have never felt half the real pleasure in the sport that I used to do when wandering in bygone days with no one but my old guide in the wild solitude of the Crowland fen. Be this, however, as it may, there is a wide field open here to the enthusiastic sportsman if he only once comes to know the country—the grand secret, after all; it is easily reached from England, and quite as accessible to men of moderate means as to their richer brethren, who are now able to monopolize the best of the sporting at home.

The English reader who has only associated Sweden with

ice, snow, and bears, would be struck with astonishment upon entering a Swedish country gentleman's house, and seeing the style of living. At first the stiff politeness of the welcome (for I know no country where the *outward* forms of politeness are more strictly observed than here, and in this respect they are like the French, whose manners are I fancy much copied) might detract somewhat from its cordiality; but before he had been an inmate of the house for twenty-four hours he would find himself as much at home as if he had known the hospitable inmates for twelve months. Notwithstanding, however, all the form and ceremony which is far too prevalent among themselves, I have invariably seen that their innate courtesy towards a stranger will cause them to overlook much which they would condemn in a countryman of their own. I have often sat down to dinner in a shooting-coat, and received quite as hearty a welcome as the other guests who were in full dress. And I may here add that dress is carried to almost too great an excess among the Swedish gentry, especially in the towns.

But, as is always the case, the female flowers in the domestic *parterre* would naturally please the stranger the most; and what I like in the Swedish ladies is this, that although they never neglect the duties of the house (and I always fancy that the women in Sweden, of all classes, have much more to do than the men), you will never catch a real Swedish lady unprepared to receive you—she is always so neat and clean, dressed in a becoming style, and ever with a glad smile to welcome the stranger. Her gown is most probably home-made, but it fits her as if turned out by a first-rate milliner. Her whole dress is plain, and with little ornament. Her hair (and they often have magnificent heads of hair) is either smoothed neatly over her forehead or gathered up behind the head. But the neatest head-dress of all is, I think, a coloured handkerchief thrown carelessly over the head and tied under the chin; this is the usual head-dress with the peasant women, but not half so much used by the ladies as it would be if they only knew how well it became them. I am scarcely judge enough to say what style of beauty is most

prevalent among the Swedish women. You see as many dark women as fair, large as well as small, and some remarkably handsome faces. And many a proud titled English "star" would find it hard to hold her own when brought side by side with the fresh healthy beauty of the north.

I do not know how it is, but I always felt soon at ease in their company; there is something so kind-hearted in their manner that a stranger is at home with them at once. No affectation, but still no forwardness. I fancy more thoroughly domestic or more affectionate women do not exist, and were I "Cœlebs in search of a wife," it is here where I should come to seek her.

It is singular, considering the very low state of morals among the females of the lower class (and a peasant rarely thinks of marrying a wife until he has lived with her some months in open adultery) we rarely hear of a *faux pas* among the better classes. I never read of an action for crim. con., and as for a duel, I do not believe that one was fought in Sweden during my time for love, jealousy, or any other cause. Nor do I believe, save in the case where a man has left his wife for a year, a divorce can ever be prayed for. Yet, with all the freedom of manners which is so peculiar to the lower classes and female servants, especially in the inns, where scarcely any one thinks of paying a bill without kissing the pretty girl who has waited on him, before all the company, I do not believe there is a bit more real immorality here than in England, for we never by any chance in Sweden hear of a trial for those crimes, which so often disgrace the columns of the English papers. The laws, however, appear to contemplate the possibility of a husband going astray, and the fine in such a case is severe.

Old Acerbi describes a little circumstance which happened to him at an inn when travelling up through Finland some seventy years since so pithily, that I cannot help inserting it here:—

"We arrived," says this quaint old traveller, "at Uleaborg, where we found a tolerable inn, the only one in

the place. At night, when we were gone to bed, we were surprised by an incident which appeared to us very extraordinary in a country of so high a latitude. I have long been in the dangerous habit, before falling asleep, of reading a book for half an hour. This evening I happened to be reading Ariosto, when I thought I heard three taps at the window of our chamber, which was on the ground floor. I paid not the smallest attention to it the first nor even the second time. When it was repeated the third time, I began to suspect it had some meaning, but as I read Ariosto, I was disposed to doubt whether it was not an effect of my imagination, heated perhaps by that of the poet. The fourth time, however, I had scarcely the shadow of a doubt that it was somebody who tapped at the window, but still, to guard against illusions, I awakened my companion, who slept in another bed in the same room, and after acquainting him with my impression, prayed him to listen and observe whether he could not hear a noise at the window. We then heard the three taps repeated, accompanied with a voice which uttered something indistinctly. I rose, put on my pelisse, and taking out my pistols, went out of the chamber to see what it might be. But how great was my surprise! It was a fine girl, who wanted a corner of a bed. I immediately uncocked, and laid aside the pistols for fear of doing mischief."

The Swedish gentlemen are in general hospitable to a fault, especially in Wermland. Good natured, polite, and courteous to strangers, and when you know them, some of the jolliest fellows under the sun. They take life easily, never meet troubles half way, and what I respect them so much for, is, that they never turn their backs upon a friend in misfortune. They dress remarkably well, and unlike many other of our foreign neighbours, are always scrupulously clean in their persons and linen. They are generally fine grown, stout, and tall, often with remarkably handsome open countenances (for a fine manly countenance, I think I never yet saw a better one than that of the present Swedish king) and take them

altogether, they are as fine and manly a race as one would wish to see. We shall, however, seek in vain, among the gentlemen at least, for the "hardy sons of the north" of whom we have heard so much; for as far as I have seen an Englishman is quite as well able to stand the cold with nothing but a pea-jacket on, as a Swede in his fur cloak, and he is always more capable of hard exercise, in the field or on the fells; and this I attribute to many causes.

In the first place, and this is perhaps to be regretted, the young of this country do not appear to have the least partiality for any of those out-door manly exercises, such as cricket, rowing, foot-ball, etc., in which every British youth is so proud to excel. Even in the schools, except gymnastic lessons, which are followed as tasks, not as pastimes, and left off as soon as ever the lad leaves school, the muscles and strength of the boys are in no way called into play. We see no merry meetings in the play ground, the cricket field, or on the village green, as we do in England; and if by chance there are a few school boys at play together, it is invariably the smaller lads, for the bigger ones appear to look upon any sort of exertion at play with the greatest contempt, "they are much above that sort of thing."

In the winter, when you cannot get much exercise on the roads or in the forests, there is often very beautiful skating. Yet scarcely any one seems to avail himself of it, except the peasants, who travel in this way over the ice to save distance. It is true we occasionally meet with most excellent skaters and swimmers, but take them as a class, among the youth of this country, there appears to be a great want of energy, and no spirit of emulation or wish to excel in manly exercises; and as we all know that "just as the twig is bent, the tree's inclined," we shall hardly expect to look for it among the men. With so many opportunities of practice in rowing, we should naturally look for a good eight-oared crew or two, among the fine grown stalwart young fellows one sees here; however, I never but once saw an amateur crew of Swedes, and that was in Gothen-

burg. I suppose the exertion of this exercise was too great, for the last time I was in Gothenburg, I saw the boat, a very clean built four-oared English cutter, laid up high and dry.

Even field sports appear to be quite a secondary consideration, except with a few, and as there is no hunting in the winter as in England, of course horse exercise is little used, and we very rarely, if ever, meet with those wiry old gentlemen with spare muscular forms, clear bright eyes, and hard bronzed countenances, whom, thank Providence, we so often see in the hunting field at home. We certainly do see some most jolly-looking men here, but they are little adapted for any violent muscular exercise.

Moreover, the very mode of life for nearly half the year is antagonistic to all the rules of training which a Barclay or a Godfrey ever laid down, and the long severe winter has much to do with this. No one who has not experienced it, can imagine what an enervating effect so much close confinement in those stove-heated rooms (with the thermometer often 22° C. warm, double windows, and the chimney blocked up, so that not a breath of fresh air can come in) has upon the constitution. Besides, the food in general use is too much after the French style, and more calculated to lay on flesh than muscle. You rarely see plain boiled or roast; all the meat is stewed with butter and sauces, and veal and pork are much more eaten, than good beef and mutton. I fancy this common corn brandy, which is invariably taken neat before a meal, is very fattening, unless walked off by hard exercise.

There is another custom here which, although a very agreeable one, I am certain is not healthy—I mean that of taking a nap on the bed or sofa for an hour or so after dinner. I often indulged in it, but I know I always felt better when I avoided doing so. It is wonderful in the winter here, how much more sleep one seems to require than in the summer. I feel sure that, with this after-dinner nap, more than twelve hours out of the twenty-four at this season are spent in sleep, and I have often heard English skippers

say, in their rough way, that if you want to do any business in Gothenburg, you must do it before one o'clock.

But certainly the worst of all is the inactivity of the life you are of necessity bound to lead here during the winter. A Swedish gentleman at this time scarcely ever thinks of walking a mile; he has little or nothing to see after on his farm, and if he wants to visit a neighbour, he always takes a sledge, short as the distance may be. We all know how indolence creeps upon a man, and there are but few of us who care to take a constitutional walk for the sake of exercise alone. Give me an object in view—field sports, collecting, or any other which keeps the mind as well as the body employed—and I never care for any amount of fatigue; but let me have to walk up and down a gravel walk merely for the sake of exercise, and I shall tire before I have done an English mile. And this is just the case here. Sporting and collecting may be considered quite at a stand still during the winter. There is so little attraction out of doors, and so much more within, in the shape of social rubbers and jovial meetings of friends, that it is hardly to be wondered at if a man prefers the latter, till at length custom becomes habit, and bodily exercise a fatigue. Such I know always used to be the case with me in the winter, for I always then became so fat and lazy that it took a deal of strong exercise in the spring to bring me back into condition.

The peasants, like our own, are hardy enough, and bodily exercise is sure to keep them in pretty good condition; but even with them the hardships of forest life and the climate appear to tell upon the constitution, especially as they advance in life.

After having observed, that scarcely any manly exercises are followed here, of course we may conclude that fair British boxing is not in fashion, and if a man does happen to get into a row (which luckily, however, is seldom the case, and it is almost sure to be his own fault if he does), he must not look for what we in England consider fair play. "Up and down" is the fashion here, and when a man is on the ground, that is the time to "give it him," and he is lucky if he escapes with less

odds than three to one against him. I should, however, care very little in what fashion a man fought if I had only *one* to deal with, for I will back any man who has a little knowledge of sparring to lick "a rough," even at his own game, by straight knock-down blows. But the worst of it is, when foreigners fight, they never let man to man fairly fight it out, but, as in an Irish row, three or four will set on one, and it is no use for a poor devil to cry out that he has had enough, with a mob of cowards on him, not one of whom has the slightest notion of fair play. If ever they do hit here (for in general they struggle), it is always open-handed, and with a round hit on the ear. A box on the ear from a strong Swede would, I dare say, be no trifle, if it reached home; but I should pity the poor fellow who tried such a game with a good sparrer, who would wish for nothing better than for his opponent to attempt such a blow, and leave his whole face open.

I do not complain of the manner in which foreigners fight. I am quite willing to back a good Englishman with his fists, who can fight, against any *one* man, and let that man use what shifty tricks he pleases, so long as he sticks to his naked hands, and stands up manfully himself without the aid of another. It is true that man is little better than a brute when his worst passions are roused, and every brute has its own peculiar tactics; but still, whatever a man's mode of fighting may be, there should at least be that generous impulse implanted in every human breast, which forbids a man to trample on his fallen foe, and that honest, manly feeling which will not allow him to use a knife or any weapon against an unarmed adversary, or to continue punishing him when he is disabled.

It is for this reason that I always have, and always shall uphold, as far as lies in my power, fair British boxing; not only because it teaches men a better and less brutal mode of fighting, but because the rules of the prize-ring, become, as it were, a law of the land when two men quarrel (which I fear will always be the case as long as men are men), and because the endurance and forbearance which

characterize a fair stand-up prize fight, must afford a useful lesson to all who witness them; and, moreover, teach all classes to view with detestation, the cowardly practice of kicking or striking a fallen foe, or setting two men upon one, like dogs.

Let the opponents of boxing at home, and foreigners abroad, abuse the British prize-ring as an arena fit for no others than blackguards and brutes. I am not here advocating the system of British boxing any further than that I believe after all it is the best and fairest mode of settling a dispute, and I am certain there is one thing which no one can deny, that if a man, whether he be an Englishman or a foreigner, happens to get into a row in England, he may be licked on his merits, but in nine cases out of ten the bystanders, although strangers to him, will take care that he has at least fair play, and that no one shall interfere with him, but the man that is matched against him; and it is singular that this is the case in those countries only where boxing is practised.

I am not at all contending that there are not Englishmen who would disgrace the worst penal settlement; and, with the brutal practices of the cowardly garotters fresh in their minds, foreigners may well contend that all our boasted English fair play is nothing but an empty vaunt; and so I grant it is with some, but, thank God, these cowardly brutes do not represent the British nation.

Very much, however, to the credit of the Swedes, the knife is now going fast out of fashion, for the laws are very severe against its use. But this is only so very lately; for when I first came to Sweden, I have seen in Gothenburg a man's face split open from the corner of his mouth to his ear; and I was then told by a friend that you never saw a *good* man without three or four gashes across his face. The knife in use for this cowardly practice is a short-bladed one, and not used to stab, but to gash the face with.

Far different, however, was it in the olden days of the "Bält spannare," where the two combatants, armed with knives, stripped to the skin, bound themselves together by

a strap round the waist, so that there could be no flinching from the cold steel, and the battle rarely ended until one or other fell dead from his wounds. These barbarous practices have, however, happily ceased in this land, and the best memento we have of the savage custom is Malin's exquisite statuette group in bronze, as large as life, of the two Swedish "Bält spannare." This is now set up in the park opposite the theatre at Gothenburg, and I never saw a more splendid piece of statuary. The two struggling forms locked together in mortal conflict, the savage, determined expression in the countenances of the two gladiators, to whom retreat is impossible, and the distended muscles, are all so natural, that one almost expects, while gazing on the statue, to see these bronze figures start into life. I remember being in Gothenburg the day it was put up, and I of course stopped to look at it. A few people were grouped around it, and among them I observed a crew of "Bohus Land" fishermen. Every one of them had his knife by his side, and when I watched their stern, determined countenances, as they silently criticized this statue, I felt pretty certain that the spirit of the old "Bält spannare" had not died out, but that if a man unfortunately came in collision with this crew, the case-knife at their sides, would be their readiest weapon.

By a singular coincidence, as I was coming back into the town, I saw exposed in a shop window a picture of the fight between Tom King and Jem Mace, which had lately come off at Thames Haven, and as I pushed my way through the crowd to have a look at it, I found the crew of an English ship standing admiring it. Now each of these men had his case-knife by his side, but, nevertheless, I felt pretty certain that if by chance I got into a row with one of these sailors, his knife would never be drawn against my naked fist; and although I might happen to get a good licking, I should at least be certain of a fair even-handed fight, and that, even if I had the best of it, his mates would never interfere. And in the full belief that this manly feeling is owing to the encouragement of fair British boxing, I have always stood up for the British prize-ring.

I like the system of educating youth in Sweden much better than in England. It is freer, and much less expensive. In nearly every town there is a public school open to all classes, and peasants' are admitted on an equality with gentlemen's sons. There is a head rector, and excellent professors in every branch of education, and a large public school-house where the lads meet, and repeat their tasks. The lads are under little or no restraint, except during school hours, which occupy from perhaps seven a.m. till twelve, when the several classes repeat the lessons they have learned out of school hours. They board and lodge with different people in the town, at a very moderate expense (I fancy about £15 will cover all the yearly expenses of their education), they do pretty much as they like, and, so long as they behave properly, go where they please out of school hours. Of course they are under the eye of the different teachers; nor may they frequent public houses, or get drunk at home. To their credit I will say, better behaved lads I never saw. No one is ever insulted by them, nor has a stranger, as is often the case in England, any fear of meeting a mob of these schoolboys in the streets; and nearly all the hilarity I ever saw them indulge in was a little lark of snow-balling a drunken peasant rolling across the court-yard in front of the school-house. The tutors all live at home with their families, and, unlike the schoolmasters and ushers in England, have little or no trouble with the lads except during the hours of teaching. They have a long three months' vacation in the summer, and a month at Christmas. The salaries of the teachers are paid, I believe, altogether by Government, which is far more liberal than any other I know, in promoting everything for the general good of the country; and each year three or four professors in the different branches of learning or science are sent out at Government expense on little trips and excursions to gain information in foreign countries. The degrading system of corporal punishment is quite unknown in Swedish schools, and as the boys all live separately there is no bullying.

The lads are excellently educated in the living and dead languages, history, etc. Botany and natural history are very much taught here, and I have thought when I have seen a party of these lads coming home, with their tin collecting cases across their shoulders that perhaps, after all, a quiet afternoon's ramble in the fields and forests around the town, may not be a bad substitute for those rougher exercises in which our schoolboys at home delight, for forming the future character of the man.

Examinations are held before every long vacation, and the boys are turned out well grounded in all the necessary elements for whatever course of life they may wish to follow. Those who are intended for the higher professions go up at once to one of the universities, Lund or Upsala, where a further course of two or three years completes their education.

At Carlstad the number of boys yearly educated is about 230, in Gothenburg, 560.

In every country house where the family is at all large, a tutor and a governess are kept; she is considered exactly as one of the family, and the rich English might learn many a good lesson from the Swedes in the treatment of their dependants. One trait I much like in the Swedish character is, that they are not too proud to endeavour to get a living by any respectable means. Most of the best-bred girls receive an excellent education, and they are not above (in case of being left poor at the death of their parents) taking situations as governesses.

Many of the officers also whose pay is but small, and who have much leisure time upon their hands, employ it in teaching, land surveying, etc., and are not thought the worse of for so doing.

However, notwithstanding all their hearty cordiality to the stranger and their jovial bearing towards each other, there is much pride among the Swedes; far different from democratic little Norway, where I believe there are only two noblemen in the whole land, and these titles are to die out with the present holders. Unfortunately, it is not the case here as in England, that the estates of the nobility are

entailed, consequently, the title is very often nothing more than an empty sound, and I cannot fancy a more unenviable position, than that of a nobleman who has nothing but his title to carry him through the world. I do not like the custom of any government indiscriminately granting empty honours. If a man has really done anything to deserve it at the hands of his country, then let that country reward him, not only with honours, but also with something substantial to support them; but when I enter a crowded assembly and see one-half of the men in the room decorated with a ribbon or a cross; and hear them addressed by a dozen high-sounding titles, I am very much tempted to ask myself whether distinctions so easily obtained can be worth the wearing.

Take them altogether, the Swedes are a very nice nation for a stranger to live among, when he gets used to the country; but it will be found very trying for an Englishman till he gets accustomed to the ways of the people and understands the language. If a man is fond of gaiety, he will be surprised at the number of balls and soirées, which are held in every town of any size during the winter, and if he is fond of his quiet rubber, and can play a good game, this is the country for him. The gentlemen are excellent card players, and passionately fond of the game, and this is not to be wondered at, when we consider the long winters in which they are so much thrown upon their own resources, and that very few of them care for any deep reading. Yet they are all excellently versed in politics and the ordinary topics of the day; and although books appear to sell as well in proportion as in England, and they are much cheaper, yet I scarcely ever saw a really good library in a country gentleman's house. Both ladies and gentlemen are fond of music, and many have capital voices. A stranger, especially an Englishman, will at first be very apt to break through many little rules of good breeding, of which no Swede is guilty; for instance, on entering a shop, and, stranger still, a common public house, you are expected to take off your hat and keep it off as long as you are in the shop or room; and really what with this, and

lifting it to almost every one you meet in the street, your hat seems rarely to be on your head, and as an old friend of mine once observed, "Were it not for the weather, and symptoms of baldness, I should certainly carry my hat under my arm or leave it at home altogether." I never yet could fancy that there was any real sincerity in all this outward politeness.

One thing will strike the stranger on entering a country house here, and that is the scrupulous cleanliness in which the rooms are kept. Carpets are not much in use, which surprises me, considering how much warmer they make the rooms, but the floors are always beautifully clean, and no wonder, for I never did see such women as these are for scrubbing. They seem to be always at it. In fact, the American sailor's creed would apply well to the Swedish woman servant,—

"Six days shalt thou labour and do all that thou art able,
And on the seventh shalt thou holy-stone the deck, and scrape the cable."

There is one curious fashion, however, here. You rarely find any soap in the washing-stand even in gentlemen's houses, and a man must of necessity carry his own soap with him when travelling through the country, as surely as he would his hair-brush. For a long time I never could solve this enigma why soap alone should be denied you. It was not, I felt certain, from stinginess, and it could not in every instance arise from forgetfulness. At length I asked an old friend what was the reason, and he told me that it was not considered nice to use the same soap which another man had used. Now, I think this was carrying his scruples rather too far.

Bear in mind one thing if you wish to stand well with your kind hostess, and that is, never come into her room in snowy weather with hob-nailed English shooting-boots on, for you rarely see here a good scraper or mat at a door. I recollect once making this mistake, and I shall never forget the agonizing glances which the lady of the house cast at the little puddles of muddy water which dotted the boards, as the snow melted from the soles of my iron-clad boots. I hardly ever felt

so ashamed of myself in my life. The Swedes have an excellent plan, they always wear goloshes, which they slip off their boots in the hall before entering the room.

The country houses are often very prettily built, and the grounds very tastefully laid out, but the rooms are generally too large, and have too many windows in them to suit my ideas of snugness; for nothing looks barer than a large half-furnished room without a carpet, an article which, strange to say, you rarely see in the north.

A hint to the sportsman. The warmest and best clothing for your feet here in winter are double-soled knee-boots to pull on over your trousers, large enough to hold two pair of thick stockings. If you sledge much in the winter, you must have a fur-lined cloak or "pels," and a pair of lined outer boots to go over your inner ones. For the forests in the winter, a good sou'-wester with ear flaps, flannel overalls next the skin, a long waistcoat, and good pea-jacket and gloves, like mittens, with only one trigger-finger, will stand any degree of cold I ever met with. My thermometer in the winter was my gun-barrel. To ascertain the degree of freezing I just put my tongue on it, and if the skin stuck I knew that the cold was something severe.

CHAPTER III.

A CHAPTER ON SWEDISH FARMING.

Although not professing to be much of a farmer myself, I have, during a country life been thrown much among farmers in many lands, and in Sweden where nearly every country gentleman farms his own land, it is impossible to reside in the country without in a certain degree becoming interested in agricultural pursuits. Moveover, for some years I have lived on the best farming school in Wermland, where I have had good opportunities of seeing the highest style of farming in the middle of Sweden, and as it cannot fail to interest the English reader, I shall endeavour to give him a slight idea of the economy and system of agriculture of Sweden at the present day.

The reader who has glanced over my general description of the country will be able to form some idea as to its capabilities for agriculture, and although Sweden (with the exception of four or five southern provinces) cannot certainly be called an agricultural country, yet there is hardly any other which I know of, whose inhabitants are so much dependent upon the produce of the soil for their subsistence, especially when we consider that seven-eighths of the population live in the country, every one of whom is more or less a farmer I may here add, however, that I have seen some very slovenly farming in Skane, which is their crack farming province; in fact, although they are much more favoured by climate and the nature of the soil in the southern provinces I doubt if their system of farming itself there, is at all before Wermland. Much as the Swedish farmer has to contend with

in the matter of climate, soil, and bad seasons, especially in the midland districts, it is very clear that agriculture is every year making good head, for into Wermland alone (which can certainly not be called a farming province) in 1848, as much as 227,254 cubic feet of corn, or about 18,000 quarters were imported, and the export was about 5116 cubic feet, whereas in 1860, the export of corn from that province exceeded the import by 200,000 cubic feet, or nearly 16,000 English quarters.

Government does much to forward the science of agriculture here, and the farming schools which are established in every province are most excellent institutions. The farming school at Gardsjo is a good type of the class.

The manager, Mr. O. E. Stenström, is the proprietor of the estate, which is about 2500 English acres, 250 of which are under his own cultivation. He receives from Government 4000 rqr. yearly, for which he has to keep and educate in agriculture twelve free pupils, peasants' sons in the province, nominated by the directors of the school. Each of the free pupils remains on the farm for two years, has to give his work for nothing, and in return receive his food, and instruction in the practical, as well as theoretical part of the business. There is a head overseer who overlooks the work, and the principal gives lectures every evening during the winter. There is a veterinary surgeon attached to the school, and workshops for the manufacture of agricultural implements. The pupils live together in a large house and are kept under strict regulations. Before leaving they are publicly examined by the directors as to their capabilities and after receiving their certificates, have no difficulty in obtaining situations as working bailiffs on the neighbouring estates. There is one of these schools in every province, and it must be clear that these lads who are nothing but raw peasants when they first come to the school are sent out into the country after two years' discipline, very different men than they would have been, had they stayed at home.

And no better proof of this can be given than the an

swer which I received from a peasant when discussing labour in general with him. He observed that formerly it was capital to work for a gentleman on his farm, but now they had all got those inspectors from the schools, and a labourer was obliged to do a good day's work, where formerly he worked pretty well as he pleased. Moreover, the peasants in the neighbourhood have an opportunity of seeing how the school is managed, and although they are very hard to turn out of their old ways, they in a certain degree endeavour to imitate the better example which is set them. The director also receives into his house a certain number of gentlemen pupils, who pay 600 rqr. (or above £35) a year for their board. (What would Mr. H. Overman say to this?)

Many young Swedes go over yearly to Scotland for a year or two to learn the practical part of the business, and come back well fitted for overseers. They have a curious idea in Sweden, that England itself is not an agricultural country, and that we are much dependent upon Scotland for our produce.

There are farming societies in every district, and there is a staff of professors who are paid by the head farming society at Stockholm to go round the country and give instruction where they are needed, in the different branches of science. Thus, if I want to drain a moss, to improve my flock of sheep or cattle, or to stock my fish-pond, I have only to give notice to the board at Stockholm, and down comes a professor to tell me what I should do. There are also Government establishments in different parts, where horses, cows, and sheep, are stationed to improve the breed.

In fact I do not believe any other country can be trying more, according to its means, to put its agricultural prospects on a better footing; and as it is only within the last twenty years, that the landed proprietors appear to have begun to stir themselves on this important subject, and we have already seen the good results of their endeavours, I do not despair but that in a few years agriculture in Sweden

will be on a very different and far better footing than it now stands.

Before entering further into the subject, I can safely say, although I know little of the country, that Norway is far, very far behind Sweden in an agricultural point of view; and although there may be some fine valleys in Norway, and I dare say some good land, I am quite certain that I am right in recommending any man who means to try farming in the north, to choose Sweden in preference to Norway, although a description of the system of Swedish farming in general will suffice for both countries.

But however much Government may do, however much a few private individuals may strive, to re-model the system of agriculture in Sweden, the agricultural prospects of the country can never flourish, until two monstrous evils are remedied.

First, until men of little or no capital, altogether renounce the ruinous practice of buying farms on mere speculation, raising probably two-thirds of the purchase-money on mortgage at 6 per cent. interest, and entering on the land and farming it themselves, without a shilling wherewith to improve and work it.

And secondly, until we see most of the farms in the hands of a class of men on the same footing as the English farmers, men of practice, not theory, who are dependent on their farms *alone* for their subsistence, who have been brought up to the plough from their childhood, and know their business; who enter their farms upon a certain length of holding, with a proper capital in hand to do justice to the land, and a practical knowledge as to how that capital is to be employed. Then we may see agriculture flourish in Sweden, and then, *and not till then*, shall we be able to judge of its capabilities as an agricultural country.

What would England be if the land were farmed by gentlemen farmers, who had a very superficial knowledge of their business, and little or no capital?

It was all very well for the editor of a little Carlstad paper, when noticing a treatise on English farming, written

by a countryman of his own (where, by the way, we are told that much of the land in England is in far worse condition than in Sweden, and worse managed), to give us his gratuitous opinion that the cause of such *bad farming*, in England, is the despotic manner in which the tenant farmers are treated by their landlords, the rich English lords, who, according to the said editor, are worse than Russians, and who only care to hold their tenants under, that they may trample over their lands with their horses, dogs, and steeple chases!

I would ask the worthy editor where he supposes the income of these "storm ricke" lords, as he terms them, would come from, if the tenant's land were destroyed by his landlord's horses, and steeple chases?

However, as far as I have seen of them (and this has not been a little), the English farmers are quite able to "hold their own," and as for steeple-chases, I wish the sapient editor could see one in some of our midland counties, between hunters worth perhaps £150 (3000 rqr.) each, ridden by the farmers their owners, over lands probably in their own occupation. Perhaps, however, he fancies we ride our steeple-chases in the summer!

It may probably be in a measure true, as Bishop Agardth says, that it would be better for any land if as much of it as possible were in the hand of the possessor, who worked it himself. So it probably would be, if that possessor were a *real* farmer, for then he could by working it, gain a much better return on his capital, and have a decided interest in improving his own estate. But I will ask, How could a large landed proprietor in England who owns perhaps ten to twenty thousand acres of good "working land," cultivate it all himself, even if he were a practical farmer? No, he knows better than this. He lets it out in parcels to men of capital who can work it, and contents himself with living a gentleman's life on the rental he receives from them.

The Bishop seems entirely to lose sight of this fact, that farming is quite a business in itself, and that no English farmer

can enter upon a farm without possessing fully as much capital to *work it*, as he could *buy* an estate of as many acres for in Sweden. And does he suppose that such a man would invest so large an amount of capital, if he were only allowed to hold his land as a tenant-at-will? But let us hear what "Sam Slick," the American, says on this subject, and it is not very likely, much as he advocates the use of "soft sawder" when selling his clocks, that he will flatter the English. Sam observes, in his pithy style:—

"Yes, too much land is the ruin of us all on this side of the water. Afore I went to England I used to think that the unequal divisions of property there, and the system of landlord and tenant, was a curse to the country, and that there was more dignity and freedom to the individual, and more benefit to the nation, for every man to own the land he cultivated, as with us. *But I've changed my mind.* I see it's the cause of the high state of cultivation in England and the prosperity of its agriculture. If the great men had the land in their own hands, then every now and then an improvident man would skin the soil and run it out. Being let to others, he can't do it himself, and he takes plaguy good care by his lease, that his tenant shan't do it either. Well then, there he is, with his capital to make great improvements, substantial repairs, and so on, and things are pushed up to perfection.

"In Nova Scotia there are hundreds and thousands who would be better off as tenants, if they would but only think so. When a chap spends all his money in buying lands, and mortgages them to pay the rest of the price, he ain't able to stock his farm and work it properly, and he labours like a nigger all his life, and dies poor at last, while the land gets run out in his hands, and is no good for ever after. Now, if he was to hire the farm, the money that he paid for the purchase would stock it complete, enable him to hire labour, to wait for markets, to buy up cattle cheap, and sell them to advantage. He'd make money hand over hand, while he'd throw the cost of all repairs and improvements on the owner. But you might talk till you were grey-headed, and you

wouldn't persuade folks of that in this country. The glorious privilege of having a vote to give to some goney of a member carries the day. Well may they call that a dear privilege, for it keeps them poor till their dying day. No, squire, your English system of landlord and tenant is the best for the farmer, and the best for the nation. There never can be a general state of high agriculture without it. Agriculture wants the labour of the farmer and the money of the capitalist—both must go hand in hand. When it is left to the farmer alone, it must dwindle for want of means, and the country must dwindle too. A nation, even if it is big as our great one, if it has no general system of landlord and tenant adopted in it, must run out. We are undergoing that process now. I'm most plaguy afeerd we shall run out, that's a fact. A country is but a large estate at best, and if it is badly tilled and hard cropped, it must in the end present the melancholy spectacle of a great exhausted farm."

If the reader turns to my chapter on Swedish statistics, he will find mention made of an "Hypotheks," or Mortgage Company, which is established in Sweden. I never studied very deeply the machinery of this gigantic loan society. I had plenty of opportunities of seeing its workings, and this was quite enough for me.

It appears that this mortgage fund is borrowed (I presume upon the security of Government) from Germany, and a certain portion is let out to the various loan societies established in the different provinces, in order to lend out again to purchasers of estates. These societies, when a man is desirous of purchasing an estate, advance him so much, say about one-half of his purchase-money, on mortgage at six per cent.; the deeds of the estate are lodged in their hands, and the company's money is of course safe, because they have the first claim. I believe this payment of 6 per cent. clears off not only the yearly interest, but a portion of the mortgage capital, and in forty years the whole debt is cancelled. This seems all very fair, and one might well argue that it could make no difference to the farmer, whether he

paid a certain sum yearly to a landlord in the shape of rent, or to a mortgage company in the shape of interest. No more it would if he were a real farmer, and were certain that the returns of his farm, if properly managed, would leave him a fair surplus, after his interest and expenses were paid. And, above all, if he had a sufficient capital left, after buying and stocking his farm, to work it properly; then this mortgage society would not only be of great service to the landowner, but a blessing to the country, because any man would naturally feel more pride in improving an estate if it were his own, than if it belonged to a stranger.

We have seen before that, allowing the cultivated land in Sweden to be 4,000,000 tunnland, the interest on these mortgage debts gives a yearly rent-charge, of about 5 rqr. per tunnland, upon every cultivated tunnland throughout the country. Now it is quite clear that the land can bear this, and that it is not the only cause why the Swedish farmers are kept poor.

According to Sanderson's statistics, in 1861, the ascertained acreage of Great Britain was nearly 73,000,000 acres, of which nearly 25,000,000 were under a rotation of cropping, and 14,000,000 in permanent pasture, or in all about 39,000,000 acres, capable of producing food for man; leaving a balance of about 39,000,000 acres of unreclaimed land, 12,000,000 of which, now only covered with coarse grass, could be made capable of carrying good crops.

He takes the value of the food produce of these 39,000,000 acres on an average, at £4 per acre. I believe we may take the average rent of land throughout Britain at £1 10s. per acre, so that, after paying off this yearly rent-charge, if Sanderson's statistics are correct, there remains only a balance of £2 10s. per acre in the farmer's hands to pay his expenses, taxes, and living, interest on capital invested, etc.

Agardth reckons that, after all impediments are deducted, there should remain in Sweden an area of above 50,000,000 English acres of land, capable of cultivation.

It will not, however, be fair to charge the 4,000,000

cultivated tunnland of land in Sweden alone, with the interest of this mortgage debt, because much other land is mortgaged, and some estates not at all: but let us lay a yearly rental of 10 rqr. per tunnland on all the cultivated land (and take the country through, I fancy there is more worth less, than above that sum) in its present state. And we will also reckon according to our last calculation, that at the present day, 5 tunna of corn, is the average yield for every tunnland of cultivated land throughout the country, at the average price of about 10 rqr. per tunna; and this will give us a yearly return of 50 rqr. per tunnland, from which, if we deduct the yearly rent of 10 rqr., we leave a balance of 40 rqr. (or above £2 5s.) in the Swedish farmer's hands per tunnland, wherewith to pay labour, taxes, etc.; and allowing, according to our before-quoted calculation, a sum of 25 rqr. per tunnland for cultivation, seed, and taxes, there still remains 15 rqr. per tunnland for his maintenance. So after all he is not so badly off, and this is the fair way to look at it.

This calculation is made after the present yield; and now I will insert another letter from a practical Swedish farmer, written in 1863, which puts the matter in another light, and a better one for the farmer, if his land is only properly managed; because although I do not think corn will rise, I am pretty certain that it will not fall below its present price.

This letter not only bears me out in my views of this, to Sweden, all-important question, but it will give the English reader a far better idea of Swedish farming as it is now carried on, and what it might be, than anything I can write on the subject. The writer says:—

"There are two things to which we have had occasion more than once to allude. The first is, that the land in Sweden is overwhelmed with debt on account of the hypotheks, or mortgage loans, and other causes; and the second, that estates have been driven up in the market to false and unnatural prices. Not that we lay much stress upon this latter, because we assert that scarcely a single estate in

Sweden during the period of high prices, has been bought too dear by a purchaser who had anything to lose, but that, on the contrary, not one in ten has been bought with the purchaser's own capital. This is where the fault lies, and it is on this account that land in Sweden does not, as they justly say, give interest for the purchase-money.

"From this source has arisen our agricultural distress. Our farmers need more capital, and therefore these debts have arisen.

"The question now arises, what agriculture in Sweden really is at the present day, and to what it ought to come with sufficient capital.

"Considering this important question, we must first set forth agriculture as it now stands undisguised, in order that we may hereafter the more readily show the reason why agriculture in Sweden does not stand as high as in Belgium, Saxony, Scotland, or other lands, whose natural relations are very similar to our own. For this purpose we will neither choose the best, nor the worst side of the question, but take a moderate view of it; for, notwithstanding the very great improvement that has taken place in agriculture within the last twenty years, it is certain that there are very few estates in Sweden which have risen above the medium we have taken.

"Let us take an estate of an area of 200 tunnland (244 English acres), in a good farming district, of which 100 tunnland are arable, the other 100 consisting of bad meadow, the produce of which in its present state will hardly pay for getting, and the rest, woods and mosses, (and this is a very fair general description of most of the Swedish estates at the present day). As we are speaking solely of agriculture, we will not allude to any estate which gives an additional income, by brick or tile-making, mills, timber, or the like.

"The land, as is usually the case in Sweden, is poor, and in bad condition; the buildings, probably, in fair order, but very inadequate and insufficient for an improved system of agriculture.

"The price of such an estate, as times now are, to purchase,

would be above 30,000 rqr. (about £1760 English, or nearly £8 per English acre), to which we must add such little capital as would be required to work the farm. Thus—

	rqr.
Purchase of the estate . . .	30,000
Six horses, at 200 rqr. each . .	1200
Fifteen cows, at 100 rqr. each . .	1500
Implements	1000
Advance for maintenance of servants, cattle, etc.	750
Household furniture	550
Total	36,000

Or a little over £2000 for the full purchase of a 244 acre farm, and the stock and implements in its present state; of which sum the interest after the rate of six per cent., (the common rate of interest here,) will be 2160 rqr., or about 21 rqr. per tunnland of cultivated ground.

"We will now make a summary calculation of the proceeds of this farm, and for the sake of shortness, without going into minute details, we will reckon the gross produce at 40 rqr. per tunnland, or a little over £2 per English acre, for the land capable of cultivation, and this, it will be seen, is lower than we have reckoned it before, but I expect that one-half of the farms as they are now managed, do not return more, without minding whether part of that produce is sold direct, or first turned into butter, flesh, wool, or cheese. Therefore, the gross produce of the 100 tunnland will be 4000 rqr.

"From this we must now deduct the cost of cultivation, such as servants' wages, repairs, taxes, etc., and we shall not be far wrong if we put this at 2000 rqr., or 20 rqr. per tunnland. Consequently, there remains out of the whole gross produce of the estate only a net sum of 2000 rqr. wherewith to pay the yearly interest of 2160 rqr., leaving a yearly deficiency of 160 rqr., and the farmer gets nothing for his trouble and labour. (And this is how farming at the present day stands generally throughout Sweden.)

"Now it is very clear, according to this, that the purchase-

money of this farm is too high, and that the farmer would be in a far better position if he rented the land capable of being tilled, at 10 rqr. per tunnland; and another thing we must remark, that the 100 acres of rough land is not calculated to give one shilling return. Now this is hardly fair, for if this 100 acres of rough woodland were so utterly barren as to lie waste altogether, no one in his senses would borrow money at six per cent. interest to buy it. I suppose, however, if the buyer had capital in hand, he would be able to make something of it.

"We will suppose (as is usually the case) that he has a hypotheket's loan or mortgage to half the amount of the purchase-money, or 15,000 rqr., and that the whole of his little capital, 21,000 rqr., is swallowed up in the balance of the purchase-money, and the necessary expenses of entering, as shown above, so he is obliged to meet the surplus expense by discount loans, (because he can raise no more by mortgage), and the produce of his farm cannot be increased by improving the soil, for that will require a longer time than the discount loan will have to be paid in.

"We will now make another calculation over the same farm, worked with a proper capital, be the same borrowed or owned, of all that a real farmer will require.

	rqr.
Cost price of farm	30,000
100 tunnland underdrained, at 75 rqr. per tunnland	7500
Artificial manures	4500
2000 barrels chalk	2000
New buildings, and repairing old . .	8000
Eight horses, at 300 rqr. . . .	2400
Forty cows, at 100 rqr. . . .	4000
One bull	500
Implements	1000
Corn for sowing, say	600
Advance for nourishment of people, and cattle	2500
Household furniture	1000
Total	65,000

"It will be seen that the additional capital required for carrying on the farm at an improved rate, will come to about as much as the original cost of the farm, and the net reserve must now cover interest for 65,000 rqr., which, after the rate of six per cent., will be 3900 rqr. yearly.

"The produce of the farm now, after it has been well drained, well manured, and with proper farming, cannot be reckoned at less than 100 rqr. per tunnland, and this is rather under, than over the mark. (And I may add, that my friend Mr. Stenström says that it is decidedly under the mark on a good farm, farmed properly and in good condition; and he, moreover, said, that he would willingly give fifteen rqr. per acre rent, for such a farm.)

"To raise this sum at ordinary market prices, we shall require to produce on each tunnland, 5 tunna wheat, or 7 tunna rye, or 5 tunna peas, or 8 tunna barley, or 100 tunna turnips, or 30 tunna potatoes, or 3000 lb. of hay.

"Notwithstanding we have an improved system of farming, and, consequently, more labour, our fallow will not increase in proportion, and the wages and expenses of carrying on the farm should not now exceed 24 rqr. per tunnland. Deducting this sum of 24 rqr. for expenses from the gross income of 100 rqr. per tunnland, there will remain 76 rqr. as the net produce of each tunnland (which, for the whole area, gives 7600 rqr.), and when from this sum we deduct 3900 for interest, there remains a yearly gain of 3700 rqr., or 37 rqr. per tunnland (a little above £2 per English acre).

"If we further follow the results on the same estate under a different state of culture, it is plain that in the first instance the insufficient capital employed, must sooner or later end in the destruction of the estate, and the ultimate ruin of the farmer. Whereas in the latter case, when the owner for a useful purpose, incurs a further debt of 30,000 rqr., the produce of the land will yearly increase, and not only leave an interest on the capital employed, but besides that, a yearly gain, which in eight years will pay off the increased capital which the farmer has borrowed, for the improvement of the estate."

I may here add that the writer of course supposes the farm to be in the hands of a practical farmer, and in a good farming district.

We will now turn to the before-mentioned letter in my farming statistics, which reckons that at the average price of corn and the present growth of an average of five tunna to the tunnland, farming, as it is now carried on, is not paying, and this I believe, but I also believe everything that is stated in the letter I have just inserted. And any man who carefully reads the two statements, will soon see the reason why farming does not pay here as it is carried on at present, and moreover that it could be made to pay if it were only carried on properly.

I have shown both the above letters to practical men, and they all agree that the figures are pretty correct, and in the main will apply to nine-tenths of the purchased farms in Sweden.

Assuming this to be so, we shall see that, in good hands and worked with a sufficient capital, farming in certain parts of Sweden might become as profitable as in England; and that a practical English farmer who knew a little of the language and the habits of the country, with a capital say of £4000, might according to the above calculation, purchase an estate in Sweden of about 250 English acres, stock it properly, and if he worked it as it should be, might calculate upon a very fair return for his capital invested. Moreover, the farm would be his own, and could never deteriorate in value by proper management; but probably in ten years' time it might be of considerably more value under a proper system of cultivation; and we have altogether left out the 100 acres of rough meadow or woodland, and it would be odd if these could not be made something of, by a good practical man. I fancy at the present time many a large farm in Sweden could be bought for the same money, if the buyer went into the market with ready cash.

I should never wish to induce any British farmer to leave the old country, and seek to gain a living in a foreign land, especially one where the language is new to him. At

first he would have much to contend with, especially in a land like Sweden, where a total ignorance of the language and the habits of the people, the severity of the climate, and the length of the winter, would try him sorely. And probably as a speculation, many of our English colonies offer a far better field, at a much smaller outlay of capital.

Happily, moreover, few men are more averse to leaving old England, and settling in a foreign country than the farmers, and no wonder. I spent my early years much among them, and since then I have mixed much with farmers of other lands, but in no other country have I found a class of men who lead such truly happy lives as the farmers of England. No matter what new country he may seek, the British farmer is sure to leave behind him, home comforts which he can never meet with abroad. Whatever faults he may find with old England, and however much he may grumble at her taxes, her institutions, and the imaginary ruin which too often stares him in the face, he loves her at heart perhaps better than any other of her sons. He is, as it were, peculiarly a part and parcel of her soil, and transplanting him to a foreign land, is like lopping a branch off the old British oak. His native village church, in which so many quiet Sabbath mornings have been spent; the innocent occupations of his early rural life; the neat homestead, the well-tilled fields, the well-shaped cattle, which it was his just pride to gaze upon, while feeding in meadows such as one never sees out of England; the social meetings at his weekly market; the merry chat at the covert side,—will haunt his memory to the last; and every one of these must be relinquished the moment he turns his back upon old England. The adventurer or man of business leaves his native home with scarcely a sigh of regret, and in the thrill of adventure or the all-engrossing pursuit of money-making, will soon forget the land of his birth, and like a true citizen of the world, accommodate himself at once to the manners and customs of the strangers among whom he is thrown; but not so the farmer, especially one who has passed the meridian of life.

Still there must be many young farmers in our overstocked land, who through necessity (we will trust not through choice) yearly leave the British shores to seek a fortune in foreign climes, and to a hard-working practical farmer with a small capital, I think Sweden just now offers a pretty good field. At first, such a man would have little difficulty in finding employment on a farming school for a year, the director of which could speak English; or at any rate he could board for a trifle, and learn the language and farming in return for his work. And I will here add that it would be the most egregious folly for a man to purchase an estate, or to think of settling in this country—if he means to have anything to do with land—till he had gone through such a course. By the end of this time he could have learnt the language, the habits of the people, and the mode of agriculture. He might then always find employment; if he had no capital, as a bailiff on an estate, or if he had capital, by renting a farm himself. Farms are always to be rented as well as bought. A man certainly can enter a farm here cheaper than in England; all implements well made after English models, can be obtained cheaper than at home. Living is decidedly cheaper. And we have just shown (from what I consider to be a very fair calculation) what return a farm in proper condition, in a good farming district, could be made to give. We will now suppose a man to buy this farm as a simple money speculation.

In our calculation, we have valued the actual cost price of the 244 acre farm at a little under £2000, and 122 acres of it, as of little real benefit to the farmer in its present state. We must bear in mind now that we are not alluding to a forest district, where the forests will give a special return, and must be bought after their timber value; but to a tract of open land in a farming district, where the woods are only plantations, and where many of them may, by cutting, burning, and hacking, be made to carry crops in time. We will therefore, for the sake of argument, suppose *all* the rough land to be worth improving, and let us in round numbers reckon the improvement of the whole farm of 244 acres

at the rate of £5 (or 90 rqr.) per Swedish tunnland, which will give us a sum of 20,000 rqr. to add to the original cost of the farm [30,000 rqr.], and if we add 20,000 more for improvement of buildings, artificial manures, etc.; the cost of the farm in an improved state will be 70,000 rqr., or about £4000.

We will now suppose the land to be in first-rate condition, and the purchaser wishes to let it. It should be worth 15 rqr. per tunnland in its improved state all round, which would give him a yearly return of 3000 rqr., or a little more than 4 per cent. on his capital. We have probably valued our improvements, as well I fancy as the purchase-money, rather too highly. So we will say that if this farm, in its improved condition, were let to a good tenant, it would return the purchaser 5 per cent. on the capital invested, and the farmer who worked it would get also a return, after all his expenses were paid. The tenant would, however, require a capital of at least 12,500 rqr., or £700 English, to come in with, or a little less than £4 per English acre, to work it properly; and we will now see how the farmer would stand, supposing his returns to be 100 rqr. per Swedish tunnland, which, as I have before said, is not a bit too much. This will give him 20,000 rqr. yearly. We must bear in mind that I am reckoning *every* tunnland to give an equal return, which probably would not be the case, and I have not deducted the fallows; but as I have valued the farm high, and as I feel pretty certain that, in a wheat district, many an acre would give a far greater return, we may reckon on a return of something like 100 rqr. per tunnland all round, of course supposing it were put into good condition, and in the hands of a persevering man who knew his business; and such are the men who are wanted as farmers in Sweden; they would, I am sure, receive every assistance and advice from the neighbouring gentry, to start them in their new field.

Then—

	rqr.
Cost of cultivation, 25 rqr. per tunnland	5000

	rqr.	rqr.
Yearly rent, at 15 rqr. per tunnland .	3000	
Interest on 12,500 rqr. outlay, at 6 per cent	750	
	——	8750
Let us add, however, 6 rqr. per tunnland more for taxes and incidentals, or		1250
		10,000

and deducting this from 20,000 rqr., we have a net yearly surplus of 10,000 rqr., above £500 sterling, off a 250 acre farm; or 50 rqr. per acre, for living, etc., after all expenses were paid.

This shows to what farming might be brought in a good district in Sweden, with a proper capital and in good hands. We can hardly, however, reckon that this calculation will apply to Wermland, and the midland districts. It will also prove that farming in Sweden will no more pay without proper attention, management, and capital, than in England; but it also proves, I think, that the farmer who farms his land as it should be, requires no protection from Government.

To an English gentleman of small capital, say about three or four thousand pounds, who was fond of farming, field sports, and a country life, I really do not know where he could invest his capital better than in Sweden. In whatever part he settled, he would be sure to have some fair sporting and fishing, and much freer than he could in England; although he might not find things at first just the same as in England, yet when he became settled among them, he would find the Swedes very good neighbours, and I really think property will in time increase in value. But he must bear in mind one thing, nothing can be done in the north without some capital, and above all things let him live at least a year in the country on some good estate, and learn the language and habits of the people, before he perma-

nently settles, or invests one shilling in land; and with ready money to go into the market, he will always find an estate to suit him. But do not let him be in a hurry, and above all, let him choose a good district. I fancy from what I have heard, the Isle of Gotland would suit a British farmer better than any other part of Sweden.

Although really practical working farmers are hard to find, I know no country in Europe where the true country gentleman is better represented than in Sweden, nor any man who passes a happier, quieter, or more domestic life, than a Swedish country gentleman who lives on his own estate, happily free from mortgage debt.

In such a case, a certain portion of the produce of his land (the principal part of which he farms himself), goes to the support of his family and household, and the sale of his surplus corn and timber covers incidental expenses. Thus he passes his life quietly and happily in the bosom of his family, a true country gentleman in every sense of the word, with just employment enough to keep his time occupied; and the cares and maintenance of his family, instead of being an anxious burden on his mind, add a double zest to life. His wife is, in nine cases out of ten, a model in the management of his household and family, industrious, careful, and saving. His children are brought up at home under their parents' eyes—the daughters, as girls should be, who at a future day will themselves, in their turn, be called upon to superintend the cares of a household; the boys till such time as they must leave their homes, and launch out into the world to seek their own fortunes. It is, therefore, not to be wondered at, that we see such true pictures of domestic happiness in these Swedish homes, where the members are so closely thrown together, and so much of the year is necessarily passed indoors, and such simple and domestic tastes prevail. Let his system of farming be what it may, such a man, *if he is only free from debt,* can always provide for the wants of his family, and live comfortably, and respected by all. I do not mean to say but that by a better system he might materially increase his income, still, if he only attends

to his affairs at home, and does not altogether leave the whole concerns of his farm to an inspector, he cannot help keeping things together, if his estate is unencumbered, and he has learnt to regard it as a family home. But far different is the case with a young man, who upon the strength of an early marriage, purchases an estate on mortgage, and saddles himself with a yearly burden in the shape of interest, which the produce of his farm can scarcely pay, (certainly not in the way he is obliged to farm it through a want of capital, and at the usual rate in which he begins to live), and, therefore, on his outset into life, hampers himself with a debt of which, (unless by some lucky circumstance or other he is enabled to sell his estate at an advanced price) he may never be able to clear himself; and it is just these young men who are looking out for an estate to bring a new married wife home to, who are so eagerly sought after by land speculators, "worth always ten per cent. at least on the purchase-money," as an old land dealer once observed to me.

It is my opinion that at the present time estates here, especially in Wermland, have been driven up to a false value, by the mania of land speculation. Many seem to think that the value of estates is yearly rising in Sweden, and that it would be a good speculation to buy up land at *its present price*, and hold it till a rise in the market. This, I confess, I can hardly see, but I fancy that with ready money, many farms might be bought cheap, and if only Sweden remains at peace, land will certainly rise in value. The Swedish prices for grain are regulated entirely by those of England, and with the English markets in their present state, it is hardly likely that much rise will take place in corn in Sweden, for, taking the price of oats in England as high as 22s., the Swedish farmer can never reckon on selling his at home, for more than 16s. the quarter. We have shown the returns which the land gives in its present state, and what it might be made to yield if a proper capital were laid out on it; but in their present state as far as I can see, estates are about at their full value. Doubtless, a man who knows his business, and buys his land with ready

money and a sufficient capital in hand to improve it, will obtain a good return for his capital, and probably double the value of his estate; but then he must expend capital on it; and certain it is, in Wermland during the last ten years no great rise has taken place; for I could quote numerous instances of estates bought within my recollection, at what would appear to an Englishman ridiculously low prices, the proprietors of which have always been in trouble for the want of capital to improve them, and if these estates were brought into the market now, I very much question whether many of them would realize their original cost, certainly not, if the purchaser paid ready money.

I really do not see any fair means of calculating the value of an estate in Sweden, for so few are in the hands of tenant farmers. Thus it is hardly possible to value the land at so many years' purchase, on the return which it gives. It would be all very well for the seller if he could always sell at his own value, for the invariable answer you get if you ask what such an estate is worth, is, "Oh, he wants such-and-such a sum for it."

They have the oddest way of valuing estates here that can well be imagined. If a small estate be for sale, it is advertised that it will feed so many horses, so many cows, and that the occupier sows so many bushels of spring and autumn corn. I see an estate in the north of Wermland now advertised for sale, the items of which may interest the English reader.

The estate consists of house, etc.

	tunnland.
Cultivated land	158
Pasture and meadow	70
Wood	867
	1095

Eight years' circulation can sow 50 tunna oats, 10 tunna rye, 25 tunna potatoes; and can feed 7 horses, 2 pair oxen, 35 cows, 10 young cattle, 30 sheep. The mortgage debt on

the estate is about 38,000 rqr., and the value set on by the mortgagees is 56,000 rqr.

Now valuing the wood at £1 per acre, or £867, to deduct from the value of the whole estate, which in round numbers we will reckon at £3000 English pounds, there remains a little over £2000 for the purchase of the rest of the farm of 228 tunnland, or say, 270 English acres, at about £11 per acre.

It is very doubtful, even at this price, if the farm in such a district would be a good speculation. The wood may be worth much more, but this all depends upon the situation.

Another method of calculating the value of an estate here I learnt from a practical man. He first reckoned how many cows the farm could feed, and allowing each to give the yearly income of 150 rqr., he calculated this as the yearly value of the estate, supposing the corn crops, etc., to pay for labour, living, and all other expenses. But I am sure I do not know how many years' purchase they would calculate on this return, in buying the farm, I fancy not nearly twenty-five.

But to recur to the subject of these mortgage debts. Were it not for the facility of obtaining money on mortgage (which, however, appears not to be quite so easy now as formerly), this mania for buying estates on speculation would be in some degree checked; at any rate the buyers would have to take their capital out of their own pockets, and they would not invest that capital so rashly, unless they saw there was a safe return for their investment; and they would not buy a large estate with as little reflection as a cow or a horse, as is often now the case. We all know if a man can obtain credit with a tradesman, be it a tailor, shoemaker, or what not, how many more articles he will purchase, than if he had to pay ready money for them as he bought them; consequently, such surplus goods nine times out of ten are unnecessary—and this is just the case with the present system of buying estates in Sweden. Not one-half of the men who now purchase estates here, have any business to do so, for they have not sufficient capital to hold them, and a chance of a

rise in the market which may never take place is all they look at. *Perhaps not one-half* are sound farmers, or have sufficient capital to make the full value of their land if they hold it themselves; and I have in more cases than one, known men purchase estates on speculation, and in the second or third year the mortgage company have taken possession, because the yearly interest was unpaid. With such a system, how is it possible to know of what the land is capable!

Still, however, if every man who purchased an estate with the intention of farming it himself, was something of a practical farmer, and as long as he had to make his living by farming, did his work like a farmer, and lived like a farmer, there would not be so much the matter, even if he had only a small capital. But there seems to be an idea here that any one can farm, and at the same time live like a gentleman. How such a notion has got into people's heads I cannot imagine, for no business, I should say, requires more practical experience, more close attention and looking after, than that of a farmer, and especially in Sweden. But here, any young man who is scarcely out of his teens, and has probably never ploughed an acre of land in his life, seems to fancy himself capable not only of managing a large estate, but of farming one himself, with little or no capital.

If farming on such a system can answer, then, indeed, our hard-working English farmers, who have been brought up to the plough from their childhood, and yet do not consider it prudent even to *lease* a farm for seven or fourteen years with a less capital than £5, and even sometimes £10 per acre, must be sadly behind the rising generation, and had better throw up their farms at once.

I have dwelt long upon this subject, for it is an important one. Sweden is a couutry with great capabilities, and with a better system of management, would be in a very different position from her present one.

We will now say a few words as to how the farms are managed. As will be seen by the foregoing remarks, there

are very few farms here held on lease by tenant farmers; most of the landed proprietors occupy their own land, and farm it themselves, with the aid of a working bailiff, whose wages will probably be £15 or £20 a year and his keep. This expense would, of course, be saved to a practical farmer who looked after his business himself.

Most of the day labourers here are what they call "torpare," *i. e.*, they are servants at will on the estate, and hold a small piece of land and a cottage at a fixed rent, but for which they do not pay in money, but by work. By their contract they are obliged to work for their landlord on his farm whenever they are required, at a fixed sum by day. One day's work with a horse or bullock, is valued in the summer at one rqr., in the winter at about 10d.; a man's work is reckoned at about the same. A day's work of a torpare female servant is reckoned at about 4d. in the summer, 3d. in the winter. These torpare are, in fact, all small farmers on the estate, but without one shilling of capital, (bound to pay the rent of their own farms by doing work for their landlords when they ought to be doing it at home); they grow their own produce, and usually own a horse, a cow or two, and a pig.

I cannot say I altogether like this system. There is far too much dependence about it, and the poor torpare are obliged to be too much under the tally system. Their holding is often a very poor one, and invariably let too dear, and the holder is scarcely ever out of debt. He is obliged to work for his landlord whenever he is called upon; to buy all his food and seed corn of him, at a far dearer rate than if he went to market with ready money; and just at the very time when their labour is of most value on their own little estates, they are, perhaps, most wanted on the head farm. The consequence is that, as far as I could see, their own land is generally in a wretched state; and, depend upon it, a day labourer, who is paid regularly so much a day, and hires his own cottage, is far better off, and certainly far more independent, than one of these torpare. Moreover, they frequently live out in the forest, far from the home station, and their

horses or bullocks are often of a very poor description, and I could never fancy they did a proper day's work.

A good day labourer's wages on a farm in Wermland, may be reckoned at about 1s. a day throughout the year—more in summer than in winter; but I fancy wages are now on the rise, as labour becomes more scarce. The day's work in summer is too long for either man or horse to do properly.

The wages of a good rough farming man, to board in the house, are about £7 a year, but on account of the railways, and other works which are being carried on, they are yearly rising. Many of our Wermland labourers go every summer into Norway, or up north of Stockholm, where they work by contract, and can earn 2s. 6d. to 3s. a day during the summer, and as living for *a peasant* must always be cheaper than in England, I consider labourer's wages higher in proportion in Sweden than in England. Labour is scarce just now in Sweden, and without these torpare, gentlemen would probably have hard work to carry on their farms. The wages of a female farm-servant will probably never exceed £2 a year, and her keep. Some of these torpare servants' wages—for even they must keep a servant to work at times for the landlord of the estate—will be scarcely £1 a year.

It is the custom here, and one which cannot be too highly condemned, to impose work upon the female farm-servants which should only be done by men. They have to slaughter the calves, and often the sheep.

The wages of a good female servant in the house will rarely exceed £2, besides a few presents at Christmas; a housekeeper has more; and, for hard work, commend me to a Swedish female servant. They never appear to know rest, for if they have an hour to spare, it is not wasted, as there is always a loom or spinning-jenny to sit down to; and I think it hard that whereas, in the autumn and winter, the farming man's work is all over by about five o'clock, the poor drudge of a female servant, can hardly finish her work till bed-time.

I never could understand how the parlour servants (for the

peasant women and farmers' servants are often coarse and dirty enough) manage to dress so neatly, and look so well as they do upon such small wages. They are often remarkably pretty, and it is a real pleasure to see how cheerfully they go about their work. I have frequently been rather surprised at the very pretty housekeepers one sees sometimes in the country gentlemen's houses; and I have been told that this is rather a fancy of the lady of the house, because it keeps their husbands at home. I wonder whether an English wife would be so accommodating.

It is the custom in Sweden, whenever you stay a night at a gentleman's house, to give a little compliment to the servant. This is called "Dricks penningar." It is no great tax, and one which I am sure I never grudged. The custom is universal. I always thought one shilling per night to the girl whom I saw most about, was quite sufficient, or if I stayed a week I would give five rqr. to her, to divide with her comrades. Nothing is expected if you do not stop a night. In the inns it is not the custom to give anything to the waiting girls, if you only take a meal. A couple of rix-dollars to a wood-watcher, if you have a day's shooting on a gentleman's land, will more than satisfy him.

The prices of labour in Sweden have risen nearly 100 per cent., within the last twenty-five years, and the price of corn within the same time, 75 per cent.

Of course, throughout this wide-stretched land, there is as much variety in the soil, as in the climate, and there are few estates of any size in Sweden upon which you will not find most of the varieties of soil which the farmer requires, as well as much which he does not require. But, like England, Sweden has its rich as well as its poor districts. Taking the land in general, I should say it was a poor, hungry soil (with patches of deep land here and there, especially by the sides of the rivers and lakes), everywhere capable of great improvement by ground drainage and care. But I fancy, especially in the midland districts, a man requires a very good practical knowledge of the soil before he enters a farm. I name this because I often notice

that corn will grow pretty well in some places, while in others close by, and apparently just the same to look at, nothing appears to do well. Probably much depends upon the under surface, especially in this country, and I will never believe in the doctrine which I have heard some men preach, that all lands may be made alike, by good cultivation and manuring.

The standard crops of the country—rye, oats, clover, artificial grasses, and potatoes—appear to grow pretty well on most farms in good years; but in the midland districts the failure of crops, partly from the climate, but principally from want of proper drainage, is not uncommon.

It can readily be understood that in a country like the middle of Sweden, where the cold snow-water deluges the ground, often in the end of April, and even in May, how much under-draining is needed.

Rye is the principal corn grown in Sweden. In Wermland it should be all in by the middle of August, and I have heard Mr. Stenström say that it will make from 25 to 50 per cent. difference, whether he gets his seed in early or late in that month; the harvest will probably fall in the end of that month. There is certainly something extraordinary in the growth of corn in this country. The seed sown in August will probably have a shoot of not longer than six inches by the middle of the next May, or in about nine months; by the middle of June it will be in ear (and they then reckon it has attained half its growth), and in two months, or perhaps six weeks more, it will be ripe and fit to cut; and yet we see, although the seed seems to lie idle in the ground for nine months, if they delay a fortnight in getting it in, they nearly lose the crop altogether.

As I said in my first chapter, the measure in use here is the tunna, and at a rough calculation we may reckon this at four and a half English bushels, and the tunnland is rather more than the English acre, although for our present purpose it will suffice, if the reader supposes two tunnas to be equal to the English quarter, and the tunnland as one English acre.

It is nearly impossible to give a good general average of

the crops in the midland districts, so much depending upon the weather and climate; and much of the land is in such wretched order that, unlike the English farmer, who can generally calculate upon his return with some certainty, the Swedish farmer in the midland districts, can hardly ever reckon when he sows his corn, how much he will reap. The case, however, would be very different if the land were well drained. And do not let the reader suppose that there are no good farmers in Sweden. There are many practical men who are only kept down by want of proper capital, and if these men rented their farms instead of buying them, their returns would be far different.

Artificial manures are coming more into fashion, and I think that chalk, which is tolerably cheap and easy to procure, is a capital top dressing for the Swedish land, which is so full of vegetable matter. Guano answers well for an autumn dressing, but the summers are often too dry to use it in the spring. I wonder, considering how much they are wanted at home, at the quantity of bones they annually export from Sweden. Composts are much used; peat-earth, of which there is always plenty on most farms, mixed with dung, is the only thing I ever knew a peasant use, up here at least, except "clean muck."

I will now give the averages of the farm in South Wermland, on which I lived, but the reader must bear in mind that the occupier is a practical farmer. The farm, however, is not a first-rate one, although much improved within the last ten years. The land in many places is not bad, but nearly all of it wants draining, and as the arable land lies much in patches, it is difficult work. This very farm, however, will prove that the land even in Wermland, if well done by, might be made to give far better returns. I have seen the corn returns for this farm ever since it has been in the possession of the present owner, and they are now just double what they were in 1851, when he entered upon it. However, where one farm in Wermland is better, twenty are worse. But even on this farm, want of capital for underdraining, bringing waste land into cultivation, and improving

old land, keeps it much back; and I have not the least doubt that if the open land were improved, as suggested by the writer of the letter above quoted, the same favourable results might be expected on this farm.

If the rye is sown early in August on a well-prepared fallow, three-quarters of a tunna seed to the tunnland, they will sometimes get back ten tunna. But this crop is very precarious (as much owing to the want of draining as anything), and throughout Wermland we cannot take the yearly average of the rye crop at more than six tunna to the tunnland, and this year (1864) I do not fancy it will give so much. I see the returns of 1863, which was, I think, a fair average year in Wermland, throughout the whole province were seven tunna of rye, to every one tunna sown, and of oats four to five tunna. A tunna of good rye here will weigh from 260 to 300 lb., and its market price in the spring of 1864, was sixteen rqr.

In preparing a fallow for rye, they ought to use 100 cartloads of manure (each of which cartloads will contain 3 tunna, or about 12 English bushels) to the tunnland, but they very seldom put on more than 60 cartloads to the tunnland, and this, we must remember, has to stand in the land always six, more frequently eight years.

Sometimes when they cut down a bit of forest here, they burn all the trees as they lie, in the early summer, and after they have cleared off the burnt logs, they spread about the ashes, and then sow rye, which they scratch in between the stumps of the trees, with a little two-pronged rake. I have seen some wonderful crops of rye grown thus; of course very patchy, but thick where it did stand. After the rye, they sow grass seeds. In a few years the old stumps rot away, and an open field is left in the place of a forest. But this will not do in all forest land.

Wheat at present seems to be only a fancy crop in Sweden, but I have seen some capital crops at Gardsjo, when the land has been fairly treated, which proves that with care the land would soon be adapted to its culture, and

I wonder it is not more attended to. An average crop will probably be 6 to 8 tunna to the tunnland, or quite as much as rye. It will weigh about 300 lb., and average in the market, perhaps 25 rqr. per tunna. They usually sow of red wheat three-quarters of a tunna to the tunnland, and spring wheat, if they can only get it in early enough, generally does well.

One thing has often struck me as curious. I never in my life saw a field of corn of any description *weeded* in Sweden. Certainly they do thin out the turnips, and hoe up the potatoes, but in most of the corn-fields one sees nearly as many weeds as corn.

Wermland is not a good barley province, but by good draining, the land might be made to carry crops. It is impossible to give an average of this crop in Sweden, which varies from 6 to 10 tunna per tunnland, according to circumstances. It should weigh 260 lb. per tunna, and fetch in the market about 12 rqr. per tunna.

Oats, however, seem to be peculiarly adapted to the soil and climate. They are usually sown three years in succession on the same land, sometimes, after the old system, six years running, just cast in, without any manure; and can we wonder with such close cropping that we often see such wretched crops? I declare I have seen such oat crops sometimes that I have wondered how a man could ever mow them. I should say, take the whole province through, that the oat crop in Wermland will not average 5 tunna to the tunnland, but where the land is not too closely cropped, and pretty fairly done by, the return will commonly be from 6 to 8 tunna. On new meadow land just broken up they, however, occasionally get immense crops, and I knew one instance, on a new bit of reclaimed land by the side of a river, when the return was 12 tunna per tunnland. The principal seed oats here, are black, white, and potato oats. They will weigh from 160 lb. to 250 lb. per tunna, and the price in the spring, 1864, was 7 rqr. per tunna.

Beans are but little grown, especially in Wermland, nor do I think I have seen anything like what we should call real

good bean land in the middle of Sweden. Peas and vetches seem to grow in most parts. I am told, however, that around Gothenburg and in Bohus Land they grow some capital bean crops.

Potatoes in the spring of 1864 were worth about 5 rqr. per tunna (but they became scarce, and in June the poor peasants had to pay 8 rqr. per tunna for their seed), and for Swedish turnips about 4 rqr. In Gardsjo they generally plant 15 tunna of potatoes to 3 tunnland of land, and get back at times 150 tunna, and they can reckon on their potato crop better than any other.

In 1864, however, in which the spring was so cold and backward, many of the potatoes were not planted until the second week in June, and yet they said if the rain came soon they might reckon on a good crop.

To show the variability of this climate, we often at night had 2° of frost at the very end of May, while in the second week of June the thermometer in the sun at five o'clock, p.m., stood more than once as high as 108° F.

Turnips are as yet but little grown, especially in the midland districts, for the land is not in sufficient heart to carry good crops. I have remarked that the turnip crop is very precarious; the best crop at Gardsjo, was about 200 tunna, or 800 bushels to the tunnland.

On good ground, but it must be well underdrained, carrots will grow well, and the crop at Gardsjo has yielded 200 tunna to the tunnland.

The clover and artificial grass crops are excellent, and as there is in this country no rich old natural meadow-grass as in England, it is the standard hay crop. The usual seed sown is white and red clover and Timothy grass mixed, 30 lb. to the tunnland, sown on rye or wheat in the spring, often on the top of the snow (very rarely on oats). A real good crop will yield as much as 10 loads to the tunnland, but they often get much less. The price of a load of such hay weighing 400 lb. will be from 7 to 9 rqr. I have known it even higher. The usual price of oat straw is 51s., and of rye straw 31s. per load of 400 lb.

The natural meadow grass growing by the sides of the rivers, lakes, and swamps, is coarse and rough. I have seen the poorer farmers cut much of the rough hedge grass, and even the bull-rushes, right out of the lakes and rivers for their cows in the winter. They also collect many birch branches in the summer, and stack them as winter food for the sheep.

Except on an occasional gentleman's estate, you rarely see a stack of corn; all is stored in large barns. In fact, there are very few Swedish farmers in a position to hold their corn in stacks, and generally they have to drive it from the field to the thrashing machine at once.

Of course as cattle cannot be out during the winter, a straw yard well filled with store oxen is never seen.

The usual rotation of crops is:—1st. A dead fallow, followed by rye or wheat, sown in August on land properly manured. 2nd. Grass and clover sown in the spring; this will stand always two years, and give a good crop; sometimes they let it stand even four years. 3rd. Oats. 4th. Oats or barley. 5th. Oats and tares. 6th. A bare fallow, and then rye again.

One of the greatest disadvantages to the Swedish farmer is the want of regular country markets, where he can meet his friends as in England, chat over the state of the crops, and sell his grain. It is true there are fairs two or three times a year in every town, where they sell their cattle, but if a man has a good supply of corn to sell, he must either ship it himself to Gothenburg, or sell it to a commissioner in the country, who is employed by some Gothenburg corndealer to buy up on commission. As there is only about one such in each district, and the saving of land carriage is a great object to the farmer, who is generally too poor to hold his corn, he is often obliged to sell at the buyer's price. The poor peasant drives his little loads of corn, or other produce into the towns, where it is bought up by the small shopkeepers, and its sale being all he has to depend upon for the little necessaries of life, he is obliged to sell at any price; and as the keg always stands invitingly in

the corner of the shop to wet the bargain, the buyer has by long odds the best of it.

It always struck me that too many hands are employed on the farms here. I knew a farm of about 260 acres of open land, and the number of days' work in the year done on that farm amounted to 3600. There were 40 cattle in the byre, besides the farm horses. Now at the rate of 300 days work in the year, this would be the same as if 12 hands were daily employed on the farm throughout the year. Surely this must have been far too many, if every one did a good day's work.

One great drawback to the Swedish farmer in the midland districts is the shortness of the summer, especially in such a year as 1864, when the spring was so late. Not a plough could be put into the ground till the middle of May, and the first thing that had to be done then, was to get the oats and potatoes in. The winter fallow was just as it lay in November. This had all to be prepared, manured, ploughed, and the rye sown by the middle of August, when the harvest would begin, and in all probability not a stroke of out-door work could be done on the farm in the way of ploughing after October. So it will be seen that, except drawing dung, all the out-door work of the farm must be done in about five months. They are bound to work hard in the summer, but the work is generally behindhand.

We have little idea in England what an immense expense and trouble, the keeping up the fires in a Swedish gentleman's country house, entails upon the occupier. At Gardsjo, which being a farming school was of course a large establishment, 400 fathoms of firewood were consumed yearly. It is true the occupier got this for nothing out of his forest, but the expense of cutting, splitting, etc., was no trifle. They reckoned that 1200 days' work at 9d. per day would be occupied in the year, in providing firing only. Had the occupier been obliged to buy, he must have paid about 6 rqr. per fathom.

The Swedish peasants in general farm their own estates, and notwithstanding that they will stick to the old-fash-

ioned ways and implements of their forefathers, and most resolutely set their faces against all improvements and innovations, they always manage to make a good living, and often, by sheer hard work and extreme stinginess, to save a little money. They certainly are in fact the mainstay of the country.

The real Swedish peasant, or "bonde," is an original. I have heard it observed that a Yorkshireman is the hardest study of man—not even barring a Scotchman,—and that a Yorkshire farmer "out-Herods even Herod." For a Yorkshire farmer read "Swedish peasant." I had the pleasure of living with a peasant for a year, to whom I paid 1 rqr. per day for my board and lodging; and I never wish to repeat the experiment. I had then a good opportunity of studying their character, and their household economy. Their stinginess is past all belief, and rix-dollars their sleeping and waking thoughts. I never could find the real key to their hearts, except by branvin. Next to branvin, a bit of tobacco is the best; and no man whose business lies much among the peasants, should be without a roll of tobacco and a bottle of brandy, for they will do much for these that they will never do for money. Like a pinch of snuff among the Scotch, or a whiff of the short dudeen among the Irish, a quid of tobacco and a dram, is the best introduction to a Swedish peasant. His nectar is branvin; and it has this great advantage in his eye, that he can manage to get comfortably drunk on it for 6d. The real old-fashioned peasant is often a heavy drinker and a heavy swearer. But for all this, he is industrious and hard-working, honest as times go, and, after all, there is something to my fancy very sterling and genuine in the character of the true "bonde" of the North. He is always civil, friendly, and well-disposed; kind, I believe, at heart; and even when in his cups, far less boisterous than his counterpart in our own country. He is proverbially inquisitive, very chatty (it is wonderful what shrewd remarks he often makes) and fond of asking questions, but easily satisfied with any answer you may choose to give him; and although covetous after money,

it is surprising how far he will go to serve you for a trifle. It is better to be careful in dealing with them, and, above all, let ready-money on either side, form the basis of the contracts. You need never try to drive one of them out of his regular beaten track. If you want anything done for you, you must let him do it after his own fashion; but one thing you may always depend upon, it will be done. He is always very civil; touches his cap when he meets you, with an open, hearty frankness, that shows he is willing to form a good acquaintance with you at once. He is often, however, exceedingly servile to those who have a larger handle to their names than himself, and scrupulously addresses every one by his titles. Titles are much more in fashion here even than in England, and I have read a notice of the death of some old officers in a Swedish paper, in which the titles alone have occupied six lines. I was once shooting with an English friend, and the peasant who was with me did not at first seem to be at all at his ease. At last he called me on one side, and begged to know how he should "style" my friend, if he spoke to him. "Oh," I said, "'Baron' is good enough for him." And my friend was highly delighted throughout the day with his new title, which the peasant took care not to omit whenever he addressed him.

Fattening cattle for the butcher seems hardly to pay; at least, it is not the fashion. They are wretched butchers. The way in which the bullocks are slaughtered is barbarous in the extreme, and I am certain I have seen a calf or pig nearly a quarter of an hour in agony before it died. There is some capital beef, however, in Gothenburg. This is probably to suit the tastes of the North Sea skippers, who set the English fashions in this little seaport, and in some of the gentlemen's houses, I have tasted an excellent round of beef. It is an open question with me whether it would not be a good speculation for an English cattle-dealer to buy up a hundred or so of the Swedish oxen, at about three years old, send them over to England, and give them a year's run to get them fit for the butcher. I

have seen some very big-framed oxen here, and I suppose for £10 a head, a cattle-dealer could pick up as many as he pleased. But the beef which is principally used in the country towns is slaughtered by the peasants, brought in, and sold in the open markets. This is really what our sailors would call "old horse," for it is chiefly either from worn-out oxen or cows past milking. Such beef is worth about 2½d. a lb. The calves are generally killed a day old, and such veal, which you might almost suck up through a quill, is worth about 2d. a lb. I wonder what nutriment there can be in such stuff as this. You never, in a town, see a clean butcher's shop; and any one who has been used to the neat appearance of the butchers' shops in any English town, will indeed be disgusted to see the carcases which are brought into the markets in the peasants' carts. The pork, however, is excellent, although the Swedish peasant's pig, when living, is about as unclean and nasty an animal to look at, as can well be imagined. A fat pig of about twelve months' old should weigh, when slaughtered, above 400 lb., and I have seen the sheep here of English race weigh in the carcase 60 to 70 lb. Mutton is perhaps worth 3d. per lb.; and pork, 6s. for the 20 lb. In the country every family kill their own meat, and October stands in the almanack as "Slagt manad," or slaughtering month. Every part of the animal seems to be used up, and the blood is much relished. These blood puddings are the only things I could never stand.

It is strange, considering that butter and milk are two of the staple commodities of the country, and so much of both are used, milk forming one of the principal articles of food, especially among the lower classes, that the cows are not better looked after. The peasant who does not keep a cow is considered poor indeed. On some of the gentlemen's estates, it is true, we now and then see a very well built and clean airy cow-house, but in general the cow-byres are low, dark, and dirty, and the cows shamefully done by; they have hardly a handful of litter to stand on, and nothing to eat in the winter save straw. In the middle

of Sweden they are brought into the house, about the end of October, and rarely leave it again till the middle of May. During the summer they pasture in the forests and grass lands, and during the winter the principal food is rye straw with a little hay. They often have no litter to stand on, and generally nothing but the bare boards to lie on, with perhaps the luxury of a little saw-dust sprinkled over them. The race of cows peculiar to the country are small, hardy little animals, and the general yield of milk among the peasants' cows is probably 300 kanna, or about 200 English gallons per year. But by those who look upon the cow in a proper light as nothing more than a "milking machine," which will give a return only in proportion to its food, be that good or bad, the cows are better tended, better fed, and the yearly returns of milk, of course, proportionally greater. At Gardsjo, where the cows are of the small Swedish race, the quantity of milk given in 1862 by 26 cows was 16,555 kanna, whereof 19 cows produced 12,160, or 640 kanna each. At Warpnäs, another dairy farm in the neighbourhood,—a much better paying farm,—where the cows are of the large Ayrshire race, the average return of milk for each cow, was 926 kanna in the year. It is very doubtful, however, whether on such an estate as Gardsjo these Ayrshire cows would have done better than the little Swedish cows, certainly not on the same keep. About £4 may be taken as the usual price of an in-calf heifer in the country. Milk, new, with the cream on, in the country, may be quoted at 3d. a kanna; skimmed milk, 2d.; butter, 6d. to 1s. a lb., according to the time of year, and cheese at all prices according to quality, from 2d. to 9d. These prices, however, do not rule the markets in the towns, and a man who happens to have a dairy within an easy distance from a town, always finds it a profitable speculation. In the state the land is now, I am convinced the little Swedish cows are best for the Swedish farmer; but as agriculture improves, and they begin to turn their attention more to stall feeding, a judicious importation of large English breed will, of course, improve the present race.

The sheep have, however, been much improved by crosses with Cheviots and Leicesters, and considering the price of wool, the immense quantity that is annually required here for warm winter clothing, to say nothing of the vast superiority of a good juicy bit of mutton, over a tough old cow, or a two days' old calf, I much wonder that sheep farming is not more generally attended to. It is true, that in the middle of the country, they must be under shelter for at least six months out of the twelve, and although, of course, at this time they should be well fed, during all the rest of the year, they can always get a good picking in the woods and plantations, round about the home farm. But as agriculture improves, doubtless this source of profit to the farmer will not be neglected. You rarely see a goat further south than North Wermland, and I wondered I saw none in Lapland.

The Swedish horses are compact, docile, hardy little fellows, showing no great breeding, but well adapted for the climate and roads, and like the cows, they can rough it upon any fare, and in any quarters. They average from fourteen to fifteen hands, and though you often see larger, I like the small breed best. The carts they draw are small, and well suited to the roads and country. Doubtless if our large English carts and horses could be introduced into the country, the farmers would get through their work quicker and better; but I do not believe our large horses would stand either the climate or the roads, except, perhaps, just in the very south,—certainly not with the keep and attention the little Swedish horse gets; and instead of trusting too much to foreign aid to improve their breed of cattle, I should recommend the Swedish farmer to do more justice to his own breed, which must be better adapted to his country. Not that I wish, for a moment, to check enterprise and improvement, but in farming an ounce of practice is, above all things, worth a pound of theory, and we must bear in mind that what will suit one country, will not suit another, and an injudicious introduction of foreign customs and cattle, instead of tending to improve the native system, may have quite a contrary effect.

Horses are dear in Sweden, and certainly would never pay for importing to England, except in extraordinary instances. Fifteen pounds is about the price of a useful country nag, such as we should see in a butcher's or greengrocer's cart in England, but without the style. The Swedes, however, are not an equestrian nation, and riding on horseback is not fashionable here, for except among the military, or an occasional town swell, you rarely see a Swedish gentleman "outside a horse." The military seat is in vogue, and as there is no racing or cross country work in this country, when you do see a man riding, he always appears to be trying to distress and take as much out of his horse as he can. Our firm, neat, short, English cross country seat and style of riding, where the rider tries to save his horse as much as possible, is not understood, and of course not being understood is ridiculed. One of these stiff bumping style of riders always appears to me to be doing a bit of penance, and in a great state of misery.

I never saw what we should consider a *real good* trotter in Sweden, and although they brag much of the Norwegian horses, I do not believe there are many, if they were fairly timed, that could do an English mile, even running (for they do not trot fairly), under the three minutes. It is true that "Rattler" was imported into England from Sweden, but he was brought first from America to Gothenburg. I have seen in print, that the best Norwegian trotters have been red. "Slepnar Varg," who trotted 1200 feet in thirty-five seconds, and "Myers Rappo" were red. "Erick Milvolds," a stallion, which trotted 1800 feet in sixty-two seconds, was red; and also "Valders Trafuare," which in 1835, was sold to a Swede for 500 specie dollars (2000 rqr. Swedish), was red; and afterwards sold, they say, which I much doubt, to Louis Napoleon for 30,000 francs. One Norwegian mile is equal to seven English miles and eighty yards, and 100 Norwegian pounds to 112 English. Thirty and three-twenty-thirds Norwegian feet are equal to thirty-one English. Now assuming that these distances were correctly measured and

properly timed, which there is no reason to doubt, and allowing 5,416 feet Swedish to be equal to an English mile, and the Norwegian foot is not much longer, we shall find that "Erick Milvold," going the rate of 1800 feet in sixty-two seconds, even if he had kept up the same pace for a mile, would not have covered more than the English mile in about three minutes; so he could hardly have held a candle to the American cracks "Peerless," "Flying Cloud," or "Lady Flora," or even to some English cracks, which I am not too old to have forgotten, and among them my own little favourite "Miss Kitty." But in a country where no prizes are given for competition, it is hardly worth while one man trying to have a better horse than another. Still Norwegian horses are much thought of in Sweden, and "Oh he's of Norsk race" is a wonderful recommendation from a Swedish dealer.

Domestic poultry is hardly so much looked after in the country as it should be, when we consider that a score of eggs at Christmas will, in many towns, fetch 1s. 6d. Peacocks, turkeys, geese, ducks, and fowls, pigeons and tame rabbits, will all thrive in South Wermland.

The taxes on the farmer appear to be very moderate; I, however, did not pay them, and I have heard the men who did so, complain bitterly. All the relief of the poor in the country is out-door, and the poor-rates are levied in grain in our district, after this fashion:—Early in spring an auction is held, to which all aged and helpless paupers are brought, in order to be let for the year: each pauper is put up to bidding, after the manner of a Dutch auction, to see who will take and keep him or her for a year, at the lowest price, and a good deal of speculation often goes on among the assembled farmers. A helpless old pauper, out of whom they can get no work, will probably let out for eight tunna of oats for the year, while one who appears to have some little work left in him, will be taken for much less. The man who hires him of course has to keep and clothe him for the year. I have heard that the best speculation is in helpless old women, because they

cannot get about to beg. This yearly quota of grain is divided among the several farmers in the district. I have heard this practise much condemned, and it certainly does appear to be a kind of traffic in human flesh. I cannot, however, see what other plan could be adopted in this thinly populated country, where the houses are so wide apart, and there are no unions or district workhouses as in England; and moreover very few are so utterly destitute as to have no relation or acquaintance who will take him or her, so the system, I consider, works very fairly.

Besides, I really believe the Swedish peasant is generally kindly disposed towards the poor and unfortunate, and these poor old bodies are perhaps quite as kindly treated as the paupers in our English unions, and they certainly are much freer. I often used to stumble upon these old boys during my summer rambles in the forest, where they regularly waylaid me for a little bit of tobacco, which was all they appeared to want. There is certainly, however, something rather melancholy in the reflection that one can live long enough to be of no use to any one, and have to be hawked about to the end of the journey, to see who will keep us for the lowest price. These old men are called "root-grubbers," and sometimes they are not let out for the whole year to one farmer, but all the farmers in the parish, if their holdings are small, take one or two of them in turn; they thus travel round the village with their swag, live a week or so with one farmer, do a little bit of work, then are passed on to the next, and so on. When I lodged with the aforesaid peasant, we had one very nice old root-grubber who used to pay us flying visits. He was a good-looking, quiet old man, of near sixty, who had seen better days, and showed it by his subdued air. Still he never complained. The first time I saw him was I recollect at Christmas, a time when of all others, the houseless and friendless are most to be pitied. "Res est sacra miser," says the old Latin poet, or in plain English, a person in affliction is a sacred thing; and never was a more beautiful sentiment uttered in any language. I was determined that for one night at least the

poor old boy should forget his loneliness, and I took care that he had his share of the bottle, which in Sweden is never empty at this festive season. On bidding the old fellow good night, I slipped a rix-dollar into his hand, and his joy was unbounded. I asked him what he meant to do with it, and hardly cared to hear his answer, as I felt pretty convinced in my own mind that a roll of tobacco, or a bottle of finkel, was all he would think of. But no such thing. "Now," he said, "I can buy a new psalm-book," and, fumbling in his pocket, he pulled out a little book of hymns, which was so dilapidated as to be fairly dropping to pieces. This little book, probably all his earthly riches, had been this poor man's sole companion in his cheerless wanderings, his solace in many a bitter trial. There was no cant here; no vain display for the sake of exciting compassion. It was evident that this book had been well studied, for he pressed me to hear him read a simple little hymn, which as he said was the most beautiful in it. When I went upstairs into my own room, and looked at my library of many volumes, I wondered which of us had derived the most real pleasure from our studies—myself with a library worth many pounds, or this poor old wanderer with a single volume worth perhaps a shilling, but which single volume told him hourly, in language which cannot err, that if all his friends in this world forsake him, the poor man has still one true Friend left, who will never desert him, let the world frown on him as it may.

CHAPTER IV.

On the Swedish Field Sports and Fishing, which will equally apply to Norway, save as regards the Localities.

ALTHOUGH no country in Europe can be better adapted by nature, for the habits of nearly every species of wild game, bird, and animal, (and the following list of Scandinavian game will prove to the reader that Sweden is as rich, if not richer than most other European countries in this respect), I can safely say that I have never yet shot in any country, where I have found so much difficulty in making a really heavy bag of game as in Sweden, save just in the very wilds of Lapland. And bad as the sporting now is generally throughout the country, and especially in the populated districts, it is every year becoming worse, owing to the laxity of the game laws and the destruction of the forests. This may be accounted for in many ways, especially as regards the feathered game.

In the first place, the severity of the weather and the lateness of the springs in the midland and northern districts, very frequently entirely destroy the early clutches of eggs, and if the second clutches are hatched off, the young birds are always small and very backward, and the chicks are easily shot off, by the pot-hunting sportsman, when the early season comes in.

Secondly, the whole country is overrun with vermin. Foxes, martens, weasels, stoats, and thousands of eagles, falcons, hawks, owls, ravens, and crows, wage a continual war throughout the whole year on the birds or eggs.

Thirdly, the game laws, as they now stand, are very badly framed, and worse observed. The season for shooting every

kind of game begins too early. Scarcely any country gentleman will go to one shilling expense in the preservation of game. Nearly every peasant is an arrant poacher in heart as well as in practice; and as long as gentlemen will continue to buy game at all seasons of the year, without asking any questions, the peasants will continue to shoot it whenever they have a chance. I think I need not give any more reasons, why game should be scarce in Sweden or Norway.

Still if a proper code of game laws were framed, and well observed, a good stock of game might soon be got and kept up at very little trouble and expense, for the whole country abounds in localities, and food, fitted for every species of European game; but never until a certain tax, say 20 rqr. per year, is levied upon every one who carries a gun, for the purpose of shooting game. This would be no hardship, for any man who could afford to give up his time to shoot for pleasure, could afford to pay a small tax, and every one who shoots for profit, should by all means pay for it.

A small tax is now very properly laid upon every dog. This varies in different provinces, but is nowhere more than 5 rqr. per year; and this does not go to the crown, but is applied towards the maintenance of the poor of the parish, or however else the parishioners think proper. This has already done an immense deal of good in many districts, and some hundreds of poaching curs have been destroyed throughout the country.

There is at present no licence required for shooting in any part of Scandinavia. The fine for trespassing varies so much in different districts, that it is impossible to give an idea of the sum a trespasser will have to pay if caught, but I believe one universal sum will soon be adopted. On some estates it will be as high as 50 rqr., in others not more than 5 rqr. It is always better for a stranger to ask leave before he sets foot on any man's land; for although he may not be caught, yet if he be, any proprietor or woodwatcher has a right to seize his gun, dogs, or tackle, which are held over in pawn till the fine,

whatever it is, has been paid. And should the trespasser resist, the fine will be heavy, and he will be put to a great deal of trouble.

There are no regular gamekeepers in Sweden, as in England. On every estate there is a "skop vaktare," or wood watcher, who has to look over the forests as well as the game; and his time is too fully occupied with the timber to devote much to the game. There is a head Crown "Jagare" in every province, appointed by the Crown; but except in the appointment of "skalls," I never heard that they did much in the way of preserving the game. In fact, Sweden, on account of the scarcity of the people and the immense tract of wild land which nobody looks after, is a very difficult country to preserve. Still I know no country where a better show of game might be kept up, if only proper means were adopted, and the wholesale destruction of the old birds in the breeding season, and the young birds before they can well fly, were prevented. The guns in general use among the peasants are of the most primitive description, and in the northern forests a shot gun is scarcely ever seen. A small pea rifle of the coarsest manufacture is used for all species of game, and it is wonderful with what accuracy these peasants shoot. The Swedish powder is in general sad rubbish, and as the ginger-bread German caps are in use also, the birds, if fairly on the wing, stand a far better chance than in England. You do not often meet with here what we should call a crack shot, although I must say I have seen some Swedes shoot remarkably well; but a peasant rarely tries a flying shot. The northern sportsmen invariably shoot with shot two to three sizes larger, than we use in England. Almost all load with paper instead of wadding; and as a shooter's powder-flask and shot-pouch are always stowed away in a game-bag, and as these are generally on the old draw-out principle, loading is a matter of some time. I once had the curiosity to time a peasant loading a single gun, and the operation occupied just eight minutes. They are much cleverer here at running, than flying shots. There is scarcely a good gunmaker in

Sweden, and the guns used by the gentlemen are often of the worst German manufacture. I am certain that a good working English gunsmith could get a very fair living in Gothenburg. Some of the old Swedish barrels are excellent; but as every common smith can knock up a peasant's gun for from 10 to 12 rqr., we cannot wonder that some very curious tools are turned out. I recollect such a gun bursting in the hands of a peasant near us, and when I examined the barrel, the breech-plug was stuck in like a cork, without the shadow of a screw. When this man was taken to the surgeon at Carlstad, he said that it was the ninth accident of the kind he had attended during the last six weeks; at least, so the peasant told me. In everything relating to game, and shooting, the Swedes may be fairly said to be at least fifty years behind the English. The sportsmen you generally meet out, are sadly careless with their guns, and as every boy of ten years old, or thereabouts, carries a gun, I only wonder that fatal and serious accidents are not much more common. Strange to say, I could hardly ever persuade a Swedish sportsman to adopt a real old-fashioned English shooting-coat and highlows. A long frock-coat and light Wellington boots drawn over the trousers, and a leather game-bag to hold everything, indiscriminately mixed, is the sporting dress in fashion out here.

But a very great improvement in all matters relating to shooting, has been introduced into the North within the last fifteen years. Still, although almost every man and boy shoots a little, there is not much really enthusiastic sporting feeling in any class, and few will go to expense in preserving.

Some very decent pointers and setters can be bought in the south of Sweden, of English breed, and at about English prices. They are all broken in the French language, and one of the greatest faults they have, in my opinion, is that they are for everlasting drawing on their game. Distemper is as common among dogs here as in England, but it takes a rather different form. Madness is, I fancy, rare; but the

regulations respecting loose dogs in the towns, are very stringent during the summer season. I have observed a rather curious trick with old pointers out here, which I never saw in England. If they find their game at a distance from, or out of sight of, the shooter, they will come back from the point, and, standing on a rock or hill within sight, bark to fetch him up; and this is very useful on these rocky moors.

The Swedish-made powder is generally wretched stuff, and I never yet could meet with any, even of the best quality, cleaner and stronger than our English F. F. This costs about 2s. a lb. English powder may be procured in Gothenburg at 4s. a lb. Formerly the import was forbidden, now the duty is very trifling. No caps except German rubbish can be obtained in the country. Very fair shot can be bought anywhere at about 3d. a lb. Any English sportsman visiting the North, must not neglect to bring over his powder, caps, and spare nipples, and *all his English fishing tackle,* with him, for although a new shop has been lately opened in Gothenburg, where all kinds of fishing tackle can be bought at about English prices, the man coming from England should never trust to these.

The artificial bait is in general use for spinning here, as it saves trouble. But the fish have already begun "to tumble" to them in the waters where they are most in use, and will hardly look at them now. I fish very little; but if I do, I never use any other bait than a small roach or large bleak, spun upon a flight of three casts of treble hooks. I may mention that the spoon bait which the Americans claim as a modern invention, has been in use among the Swedish peasants, for more than half a century. The blade of an old tin spoon, with a large single hook soldered on to the *thin* end, and a rude swivel attached to the broad end, is the pattern. Use triangle hooks the size of those recommended by Mr. Pennell in his art of "Spinning for Pike," but by no *means adopt his fashion of flight.* Perhaps we are all very stupid out here, but I never found a man yet who could spin a bait properly with it, and we tried to copy his pattern exactly. Nothing beats a

flight of three treble hooks on gimp for pike, on twisted gut two or three sizes smaller, for salmon and lake trout. Use no lip hook, but sew the mouth of the bait round the gimp or gut. Any fishing tackle maker will furnish this pattern; but mind that the bottom hooks which curve the tail of the bait, are whipped pretty close into the bend of the next triangle, or the tail will never keep its bend. This is a fault I almost invariably remark, in all the flights of spinning hooks I have seen come out of the shops. We generally whip our hooks for the flight, into about ten inches of gimp or gut, and to the end of this, loop the first swivel, not too small. I like then a trace of treble gut, or strong gimp for heavy fish, about two to three feet long, with two swivels to loop out the main line, which I would always recommend to be of good plaited hair, and from eighty to one hundred yards in length. It is not easy to give directions about leads, for they vary so much with the depth and swiftness of the stream. It is always best to find out some fisherman who is used to fishing the particular water, and he will show his leads. I have seen men use nearly one pound of lead, when fishing some of the streams in the south of the Wener, and in our inland lakes, especially in the summer, I have caught best with scarcely one ounce. A stiff twelve foot three, jointed rod with a spare top or two, and lots of large standing rings on it, is the best kind when a rod is used; but when rowing round the grass in boat-fishing for pike, by the side of a river or lake, a much easier and simpler plan is adopted; instead of a rod, use a wooden winder or reel, round which the line of about forty to fifty yards is wound. This the fisherman, who sits in the stern of the boat, holds in his hand, or even sticks in a hole made in the gunwale of the boat, letting the line, to which are attached his bait and leads, run out behind the boat, while the rower pulls gently and quietly round the lake, or by the side of bullrushes, where the pike always lie. The fisherman feels directly he has a bite, and hauls the fish up at once. This is really the laziest kind of fishing, but it has this advantage—the tackle is very portable; and if an artificial bait is used, there is no

trouble whatever. And as during the summer, one is much on the water in this country, it is just as well to have such a bait hanging at the end of your boat as not. Large trout are often also taken in this way, and I have caught perch above four pounds; but the real trout or salmon fisher will always spin his bait with a rod, and use a natural bleak when he can get it. I may mention that in all the lakes and rivers in the interior, spinning is almost the only kind of fishing adopted, and a good spinner with proper tackle, will be able to catch lake trout, pike, jack, and perch, in any waters where they are to be found. A fly rod and tackle may be taken as an accompaniment, but all the heavy work will be done by spinning; and I may add that half the success of the fisherman will depend upon his boat, and the man who rows him; for most of the fishing in the interior has to be done from a boat.

Every lake and river is full of perch, and the common English fresh water fish, and the bottom fisher will find as much sport as in England, in almost any water here. Therefore I need say no more, than that his good English tackle will be all that he will require, and a small punt, at about a cost of 15s., which he can manage himself, will render him independent, and afford him many a quiet hour's amusement wherever he is stationed.

I shall have a few more words to say respecting fishing at the end of this chapter; but as what I have written above is indispensable for the fisherman to know before starting, I thought it best to put it in, at the beginning of the chapter, where it will have more chance of being read.

The reader will find further on in this chapter, a list of both game birds and animals met with in Sweden, with the localities which they frequent, and a little information respecting the methods adopted for their capture. I shall here, therefore, only state briefly that when a man is once settled in the country, he will have no difficulty in obtaining shooting and fishing in almost any district, but he must make up his mind to be content with moderate sport. The best and wildest shooting is certainly to be

obtained in the neighbourhood of the great dividing fell range between Sweden and Norway. I do not suppose it would matter much, on which side he was stationed. I should of course prefer the Swedish side as knowing the country best, and I fancy the sportsman will find things far cheaper, and the peasants less exorbitant, and more accommodating in Sweden, than in Norway. He will require to be up as far as 62° north lat. at least, before he will reach any of the true fells for ptarmigan. In the north of Dalecarlia, and on the fells towards the Norwegian frontier, every species both of furred and feathered game peculiar to Sweden, except perhaps partridges, are to be met with, and trout and char fishing in every lake and stream. The whole south of Sweden up to about 59° is much more open, and the forests much smaller, than when we reach Wermland. There is excellent partridge and black game shooting in many parts, and the English sportsman may here enjoy some good open shooting to his pointers or setters, which he cannot do much further north.

The Island of Gotland would, I fancy, be an excellent station for the sportsman, and the snipe and woodcock shooting there is excellent. The double snipe breeds there, and it has been reckoned, at a rough calculation, that about 200 birds are yearly killed at the present day on this island. A sportsman from that island, writing in the "Swedish Sporting Magazine," says that the greatest number of common snipe which he has known to fall to one gun in one moor, was nineteen, in five hours shooting, but this gives us scarcely any idea of what the shooting really is there. The same writer observes, respecting the woodcock, that probably every spring 1000 woodcocks visit this island for the purpose of breeding. Of these he reckons at least one-third are shot, before and during the early breeding season while "roading." If we now reflect that the remaining two-thirds are scattered over about twenty square miles (300,000 tunnland) it is easy to guess, that the sportsman may beat over a good deal of ground without flushing many cocks. The woods on Gotland are beautifully adapted for

woodcock and black game shooting to a pointer, for they are principally composed of fir trees quite free from branches till long up the trunk, with a luxuriant under growth of high thick heather. The island is interspersed with open marshes or mosses, affording excellent localities for all species of waders. There is good coast shooting all round the island, and capital duck shooting both inland and out at sea. There is plenty of partridge shooting on the island, and the climate is so mild, that now and then woodcocks remain there throughout the winter. Living is cheap, the people are kind and friendly; it is altogether a most interesting island, and I know no part of Sweden which I would prefer to Gotland for a year's residence. It may be reached easily from Stockholm by steamer.

The Swedish game laws are undergoing alteration, and, will, I think, in future, be much more strictly observed than heretofore. In all probability the following will be a synopsis of the new Swedish game laws.

Elks are only to be lawfully shot in August and September, and the season is to close before the pairing season, which takes place early in October. The fine for killing an elk out of season to be about £15, besides £5 to the owner of the land on which the elk is killed. It is the custom in some of the northern forests, to kill the elks with a sort of natural bow and arrow, formed of a young tree bent across the forest ride. This is very dangerous for horses and other cattle, and these "Elg Ledar," as they are called, are to be prohibited under a fine of £50.

The season for capercaillie, roedeer, wild reindeer, hares, black game, hazel grouse and willow grouse, to commence on the 10th August, and close on the 15th March.

For partridges from the 20th August, to the 1st November. I cannot see why partridge shooting should commence earlier in Sweden than in England, and it might very well last till December, for very little snow falls in the south of Sweden, before that month.

For swans, common wild ducks, eider, and double snipes (why woodcocks and common snipe should not be protected I cannot see), from the 10th July, to the 15th March.

The eggs of all the above-named birds are to be protected. The fine for killing any of the above-mentioned game, except elk, or buying it out of season, to be from 10s. to £10.

No dogs to be used for hunting in the forest from the 15th March to the 10th August, except for bear, wolf, lynx, or glutton.

If these laws are only properly observed, in a few years' time, we may expect to see as good wild shooting in Sweden as any country in Europe, for nothing keeps the stock of game down in this country, so much as the total and wanton disregard of the laws relating to its preservation.

The fine for trespass will probably hereafter be from 10s. to £5.

These laws will only relate to Sweden, not Norway. I do not, however, see how game can be protected, unless regular game-keepers are appointed on every estate.

The list of animals pursued either for sport or profit in Sweden includes the following:—The bear, wolf, elk, reindeer, roedeer, lynx, glutton, otter, marten, badger, fox, Arctic fox, hare, squirrel.

The red deer is occasionally met with, according to Nilsson, in some of the forests in Skane and Western Gotland, and I believe also on the west coast of Norway; but it is certainly so rare that I cannot include it in my list. I never either saw or heard of one being killed in Sweden. Here and there a fallow deer may be seen tame in a park in the south, but they were never wild in Sweden.

The beaver may be said now, to be entirely rooted out of all parts of Sweden, except the very north. Some few, however, still remain in the wilds of Lapland and Finmark, for between the years 1857 and 1860, 67 beavers were killed up towards the North Cape.

The list of feathered game will include the capercaillie, black grouse, hazel grouse, ptarmigan, willow grouse, par-

tridge, quail, woodcock, great snipe, common snipe, Jack snipe, land rail, common wild duck, teal, widgeon; and some others, such as swans, geese, diving ducks, golden plover, and waders.

The Bear.—As I never killed a bear myself, or even joined once in a "skall," I can give the reader very little information, respecting the chase of the bear. But there are plenty of them still, up in the forests of North Wermland and Dalecarlia. I do not suppose that a man who really meant bear-hunting, would have any difficulty in killing three or four in the winter, with the assistance of one of the professional bear-hunters who live up here. But in the first place he must remember that to follow the chase of the bear here in the winter, it is *absolutely necessary* that he should be able to run on "skidor," or the long snow-skates which the Laplanders use. He cannot do anything without them, so his first lesson in bear-hunting will most probably be his most difficult one. These snow-skates are from twelve to fourteen feet long, about as broad as a man's foot, and turned up at the point. The foot is stuck in two loops in the middle of the "skidor," and the wearer shoves himself along, first one leg, and then the other, over the snow, keeping himself on the balance with a pointed stick (which cannot sink in, owing to a round shield placed about eight inches up it). When the snow is well frozen, and a man can run well on skidor, it must be a delightful mode of travelling, for then there is no necessity to lift the feet from the ground, but to keep gliding along over the frozen surface; but when the snow is in a bad state it is troublesome, and very laborious work, for the leg has to be lifted at each step, and the weight of the skidor is considerable. However, no man can do anything at all in the northern forest or up in Lapland during the winter, without the skidor, so it is all important that a sportsman who really means to camp in these forests for a winter, should first learn to use them. I cannot run on them myself, nor did I ever meet with any Englishman, except Mr. Lloyd, who could; but I should say that an active young fellow, who did not mind a few

bumps, would learn to run on skidor as easily as on a pair of skates.

The forests being now disturbed so much by timber-cutters, the bear is disappearing from many tracks; they are still, however, to be met with in many parts of the forests where charcoal has been burnt, especially up in Dalecarlia; and any English sportsman who has a wish to spend the winter in bear-hunting, may settle in the little town of Mora, Sara Idre, or Transtrand (all which places can be easily reached by road), in Dalecarlia, where he will be in the very middle of the best bear district, in autumn, and obtain an introduction to one of the äfuer jägare, or head huntsmen, who will soon put him into the way of obtaining his desired object. There are several regular bear-hunters in this neighbourhood, and in a late number of the "Swedish Sporting Magazine" I see the names of six, who in all have killed about 115 bears. But "Finmark Amt" must be the happy hunting ground of the Scandinavian bear-hunter; for we read in Mr. Barnard's "Sports in Norway" that, according to a Norwegian pastor, "there is a hill in his parish where a man may feel certain of seeing a bear *any day* he goes there."

The bear is rarely killed in the summer, although one would fancy that this were the best time, as they are then wandering about over the forests in search of prey. I fancy they are very poor then, and the skin is worth nothing. In the winter, as all know, they lie up in winter quarters, or, as it is called here, go to "ide." They rarely take possession of their ide, which is either an old deserted ant-hill or a little cavity under a fallen log, till the first snow-storm sets in, and so it is not difficult to ring them. This "ringing" is the process which is used by the bear-hunters, to discover the place where the bear has gone to ide, or taken up his winter quarters. As soon as they discover the track of the bear in the snow, it is followed step by step till the hunter has reason to believe it has taken to its den at no great distance. "This," as Mr. Lloyd tells us, "is indicated by his proceeding very slowly, and in a crooked

direction, or rather by his doubling in the same manner as a hare, for as long as he goes in a straight line, he has no intention of lying down." The man now leaves the track, and commences an extended circle round the suspected part of the forest. Should he succeed in completing this without again meeting with the track, he knows, of course, to a certainty that the bear is within it; but if, on the contrary, he finds the animal has proceeded beyond his intended circle, he commences another ring, and so on till he is certain that the bear has not gone on. This is often a long and troublesome occupation, requiring great patience and silence, but one of all others particularly suited to the northern peasant. As soon as the bear is ringed, he may be said to be as good as killed, for although he may be disturbed from some cause or other, and travel further in search of another ide, he is now well and carefully watched.

If any English sportsman is in the neighbourhood, the peasant will gladly sell the bear, with the chance of killing it, to him for probably from £5 to £10. (I never bought such a chance myself, but reckoning the skin at 50 rqr., and the meat, say 500 lb.—the general weight of a full-grown bear—at 3d. per lb., this would be, probably, about its full value.) Of course, now the man who has bought the bear has only to find and kill him, and this I fancy, with the assistance of these peasants, is no very difficult task.

I am not about to enter into a description either of the habit or the chase of this animal, for if I did, I must borrow all from books. Any one who wishes to know more on this subject may consult the fountain head, Mr. Lloyd's "Northern Field Sports," and here he will find full information. All I can say to him is this, that I believe a man who really meant business, would not have much trouble in killing four or five bears up in North Wermland or Dalecarlia (if he behaved liberally to the peasants) in the course of any winter, and I think he might reckon, that with one thing and another, every bear, if he wished to kill it for himself single-handed, would cost him £20.

I believe Mr. Lloyd rarely used a rifle. A double-bar-

relled Manton, with two bullets in each barrel, was his favourite weapon, and only in one instance out of the numerous bears that gentleman has killed has he been seriously mauled. He told me himself that he did not consider a revolver would be the slightest use against the charge of a wounded bear. Blocked in as a man is with snow, and his pockets perhaps full, in nine cases out of ten, he could never get it ready in time, nor if he did, would a small revolver bullet have the least effect in stopping the charge of a bear. The only chance appears to be to cast yourself down, and "take your punishment like a man," without a groan (for the better you "play possum," the better the bear will behave to you), and leave the rest to Providence. It does not appear, as we all fancy at home, that the bear always advances on his hind legs to hug you in his forepaws. The bear which attacked Mr. Lloyd charged him "end on end," and knocked him head over heels in a moment. As Mr. Lloyd describes it, "in a second or two he was upon me, on all fours, like a dog, and, in spite of a slight blow that I gave him on the head with the muzzle of my gun, for I had no time to apply the butt, he at once laid me prostrate."

The scene is depicted in an excellent tinted engraving in Lloyd's "Scandinavian Adventures;" and as it is not every one who has it in his power to relate such an adventure as this, I make no apology for borrowing the following very graphic description from the pages of the same book:—

"Had not the beast been so very near me," says Mr. Lloyd, "when I fired my second barrel, it is probable, from his wounded state, I might have got out of his way, but flight on my part, from his near proximity, was then too late, and once in his clutches and (now that my gun was discharged) totally unarmed, the only resource left me was to turn my face to the snow, that my features might not be mutilated, and to lie motionless, it being a generally received opinion in Scandinavia that if the bear supposes his victim to be dead, he the sooner desists from his assault. In my case, however, although I played the defunct as well as I was able,

the beast mauled me somewhat severely, about the head in particular. My body also suffered greatly from his ferocious attack, which extended from the neck and shoulder downward to the hip; but he did not attempt to *hug or embrace me*, as we in England seem to imagine his custom to be when carrying on offensive operations, nor did he seemingly molest me in any way with his claws; all my wounds were, to the best of my belief, inflicted with his fangs.

"This goes somewhat to corroborate the idea that commonly prevails in Sweden, that in attacking a man, and beyond holding him fast with his claws, the bear never, in the manner of the lion or the tiger, strikes with his paw, which they say is his usual habit when making an onset on horses or cattle. If this be true, it is well, as otherwise, from the very great muscular power of his arm, annihilation would probably quickly follow the blow. But after all, no inference can fairly be drawn in my case, as the beast's forbearance towards me might have arisen simply from my remaining quite passive. Had I, on the contrary, been on my legs, and offered resistance, I might probably have felt not only the weight of his paws, but the pressure of his embraces. Neither at the time of receiving my first fire, nor whilst making his rush, did the bear, as is usually the case when enraged, utter his usual half roar, half growl, even when I was lying at his mercy. No other than a sort of subdued growl, similar to that of a dog when disturbed whilst gnawing a bone, was made by the beast, and so far from coming at me with open jaws, as one would suppose to be the case with a wild beast when making his onset, his mouth at the time was altogether closed.

"The pain I suffered from his long-continued attacks was bearable. When I had my limbs in his jaws it more resembled their being stuck in a huge vice than anything else. But when his jaws grasped, as they did, the whole crown of my head, during which I distinctly felt the fleshy part of his mouth to overlap my forehead, and his fangs very deliberately scored my head, my sufferings were intense. The sensation of his fangs slowly

grating over the bare skull was not that of a sharp blow, as is often the case when a blow is inflicted, but rather, (though very much more protracted) the craunch one feels during the extraction of a tooth.

"From certain circumstances I have reason to believe the bear continued to maltreat me for nearly three minutes, and as I perfectly retained my senses the whole time, my feelings whilst in this horrible situation are beyond the power of description. But at length the incessant attacks of my gallant little dog drew the beast's attention from me, and I had the satisfaction of seeing him retreat, though at a very slow pace, into the adjoining thicket, where he was at once lost to view.

"Immediately after he had left me I arose, and applied snow by the handful to my head to staunch the blood, which was flowing from it in streams. I lost a very large quantity, and the bear not a little, so that the snow all around the scene of conflict was literally deluged with gore.

"From the wretched state of the snow, and the distance, my comrades did not join me until a minute or two after my antagonist had retreated, and when I was on my legs bathing my wounds. Elg [his servant], whom I had called twice by name at the instant the bear was about to close with me, had no idea I was in jeopardy, but merely that I required his aid in killing the beast. Under any circumstances it would have been impossible for him to have rescued me, for at the time of the mishap he was considerably below, on the hill-side, which was precipitous, and a dense brake, moreover, intervened. When, therefore, he came to the spot, and saw the blood on the snow, he, without noticing the state I was in, looked about him and inquired for the carcase of the bear, and was taken a good deal aback when he found that in this instance it was the beast, and not myself, that had proved the victor.

"At first, from the pain of my wounds, and the weakness consequent on loss of blood, which ran from my head so as almost to blind me, I thought myself much more hurt than I was in reality, and disabled for that day at least. So

that, on my comrades coming up, I forthwith directed Elg to put an end to the wounded bear, whose tracks were deeply marked with blood, which he effected in about ten minutes, and within two or three hundred yards of the spot where the encounter between us had taken place. And a very few minutes afterwards, having in the interval greatly recovered myself, and put my gun, which in the *mêlée* had been buried in the snow, in order, I rejoined him on my skidor."

I saw Mr. Lloyd a short time after this occurrence, and he then related the fact to me just as quietly as he has described it in his book. He adds:—

"Our prize (which is now stuffed in the British Museum), a male, was emaciated from age, as we imagined, and his fangs either broken or greatly blunted. To the latter circumstance my preservation, under God, was probably attributable; for had his fangs entered my person in every place where they had left indentations, I must have been literally torn to pieces. As it was, I escaped wonderfully. My body, to be sure, was covered with severe contusions, for (the skin being only slightly raised) wounds they could hardly be called. Two or three days subsequently, indeed, the whole of my left hip, and the adjacent parts were perfectly black. My right hand and wrist were a good deal hurt, for at the commencement of the affair, how I know not, I got my hand into the mouth, and even partially down the very throat of the beast, where it seemed as if embedded in slaver. My skull, for a considerable extent, was laid bare in two places, one wound, by the doctor's account on the following day, being eight, the other nine inches in length, though part of both were of course superficial; but from my hair being cut very short, and the fangs of the beast thus readily passing through it, I escaped being scalped, as would inevitably have happened had it been worn long, after the fashion of the Swedish peasants.

"Happily, however, I was so little disabled by the injuries inflicted on my person by the bear, that I contrived to make my way the same evening to my quarters, a distance of seven or eight miles, and with the exception of

the last two, when I obtained a horse, either on skidor or on foot. But for a long time subsequently I suffered much from my wounds and weakness, arising from loss of blood; not sufficiently so, however, as to prevent me (though it was certainly a great effort) from taking the field again four days afterwards."

So it will appear from the foregoing account, that the chase of the bear is not altogether unattended with danger; and all I hope is, that should any of my readers be placed in a like position, he will have "as safe a deliverance."

The chase of the bear, however, in winter, in these forests is not a boy's game; and Mr. Lloyd declared to me himself that he has gone through as many hardships and perils in the course of his bear-hunting life as any of our mighty Nimrods in the wilds of Africa.

If ever I went bear-hunting I should like to see a "skall;" but this game will not suit the real bear-hunter, who wishes to keep all the profit as well as all the adventure to himself. These skalls, or hunts, take place when a certain number of peasants are called together by the authorities of the district in which any mischief has been done by bears or wolves at a certain station, to encircle the forests, and drive all the game within the limits of the cordon, or beaters, up to the guns. They are, in fact, battues on a large scale, carried on under certain rules laid down by the Crown huntsman, or other head man who has the management of the affair. I have no space here to describe the arrangement of a skall, nor would it be at all interesting to the reader. I can only say, that if any British sportsman who was residing in Wermland wished to join one, he would have no difficulty, on applying to Mr. Falk, of Rysater, the head jagare, or huntsman of the province. Due notice of the skall is always given in the churches, for it is compulsory on the peasants to attend without pay, and even to bring their own provisions with them, and many come to the meet from a long distance. The summer skalls are the largest; but as game is always afoot at this time of year, and wandering about more than in the winter, they are not always successful.

The winter skalls are smaller, and generally pretty certain of success.

The largest skall in my recollection took place in Mora parish, in Dalecarlia, in Midsummer, 1856. They drove the forests for three days up to Wengan Lake, where the skall place was fixed. The men engaged amounted to 5,000, and the line of beaters extended above 50 English miles. Sixteen bears, young and old, were killed, which, as many of the peasants observed, was very little to compensate for the loss of about 25,000 days' work at this busy season of the year.

The Elk stands next on my list. It will be seen that only two months are allowed for the chase of the elk, and most probably the season will hereafter be limited to August and September. Owing to the stringent manner in which the elk are now preserved, they are gradually spreading over the midland forests, and there is good sport to be had in many of the forests in South Wermland; but they do not go further south, nor do they range further north than about 64°, or just where the southern limit of the wild reindeer in Sweden ends. But in Norway the wild reindeer come further south, and in that country the elk goes as far upon the fells as the pine grows. With us they appear to have their favourite forests and haunts. They chiefly frequent wild desolate forests far away from the dwelling of man, and are partial to swampy, low tracts near water, where the sallow, willow, aspen, and other green trees, grow, of whose bark and leaves they appear to be very fond. In these tracts they keep together during the summer, generally in families, of rarely more than six to eight. In the autumn, however, they congregate in small flocks of fifteen to twenty. They now usually keep about one spot, and such a place is called in these forests an "elgstånd." Towards winter they again separate, and draw up into the higher forests, into the thick pine woods, where they seek shelter from the wind and storm. The rutting season is in the end of September, and now the old males are often dangerous to meet in the forests. The female brings forth in

the middle of June, at the first birth one, afterwards two calves. The way in which we always hunt them in our forest is by having a small "skall"—planting the guns across a certain part of the wood, and beating up to them. We very often, of course, have a blank; but the best "skall" I ever saw was in 1861, when we killed four elks, and sent one away mortally wounded, which we lost. A good rifle is, of course, the best thing for this sport; and my advice would be to an English sportsman who comes here, either for bear, elk, or wild reindeer shooting, to bring over a short, heavy double rifle, which will carry a two-ounce ball, for I never yet saw an elk fall stone dead to the first shot with an ordinary bullet. They always carry it away some distance, and often fall dead in the forest from internal hemorrhage, a long way from the place where they are shot.

Another way of killing them is to follow them with an elk hound, trained for the purpose—which will bring the elk to bay, and the shooter then creeps up and kills it; and this is perhaps the surest way of shooting wild reindeer on the fells. This is often laborious, but exciting, sport. Such a dog is of no use except for elk and lynx, and when properly broken, will cost about £10. I do not think it is any use trying to stalk them in the forest without a dog, though, of course, by wandering about a man might get a chance shot.

The principal destruction of the elk hitherto has taken place in winter, when their worst enemies, the wolves and "sked'lopare" (peasants who can run on skidor), make often sad havoc among them. At this time it is very difficult for the elk to run, because it sinks into the snow, and a wolf or man on snow skates (skidor) can slide over the top surface. However, I do not fancy there are many wolves in the middle of Sweden just now, at least certainly not about us; and as the fine is very heavy for killing an elk in forbidden time, and it is strictly enforced, the breed will considerably increase in a few years. It's not very easy, moreover, to kill an elk without being found out (especially among

these inquisitive peasants), for it is not as easily carried home in the pocket as a hare. There may probably be some wild forests up in North Wermland and Dalecarlia, where the elks might be the property of those who killed them; but, I believe, if a stranger killed an elk hereabouts, he must either pay for it, or give it up to the owner of the forest, unless he had leave from him to shoot elk.

An elk is worth not a little, especially to a peasant. I remember at one peasant skall, got up here in 1863, a fine old bull elk was killed. He was sold as he lay for 150 rqr., or about £7. A large male elk of five years old, which was carefully weighed, when he was skinned and cut up, weighed as follows:—

	Swedish lb.
The fore-quarters	300
The hind-quarters	260
The back, with the neck	60
The head, with the horns and ears on	60
The feet, cut off at the knee	32
The raw hide	60
The intestines, without the blood	400

So, altogether, the full weight of the beast was 1100 lb., of which we might reckon 600 lb. good beef. But I have seen and killed them larger. It is on record, and I really believe this is true, that a young bull killed in autumn, in Nerike Land, weighed over 1400 lb.

The meat, when fresh, is capital, very like juicy beef, but darker, with a fine gravy taste. It is worth in a town about 6d. a lb. The skin is worth little or nothing, except for harness and making leather breeches.

The habits, size, colour, and form, of our Swedish elk, so precisely agree with those of the North American moose in every respect, that unless some minute osteological difference can be found to exist (as is the case in the beavers of the two countries), I think we may fairly consider them as one and the same animal.

In a correspondence which I have lately had on this subject with Captain C. Hardy (of Nova Scotia), so well known to all the readers of "The Field," he tells me that in the last molar of the upper jaw of all the moose which he has examined, a small tubercle is affixed to the inner side, which is not to be found in the cariboo or other deer. It may be peculiar to the American moose. I have not the skull of an elk by me to see if this is the case with our elk, but I will certainly try and procure one next autumn. I fancy, however, from what Nilsson says, that it is so. Will, however, so trifling a mark of difference as this, even if it does exist, serve alone, to form a good specific distinction? I agree, with Captain Hardy, that if we can prove that the forehead of our elk is invariably broader than the American moose, as he says, the two differences put together might be something.

The Wild Reindeer.—Of the chase of the wild reindeer I know nothing from personal experience. They are, however, to be met with on many places on the Norwegian fells, and doubtless a good deer-stalker might have some capital sport. But a man who wishes to follow it must be accompanied by a professional hunter, who knows the haunts of the deer in his neighbourhood. It is needless to say that it is only on the fell ranges they are to be found, and about July the best place to look for them is in the meadows which lie between the fells themselves. It appears that the fell range between Bergen and Christiania is the best tract for wild reindeer in Europe.

I have no advice to offer on this sport further than to say, that the man who would make up his mind to rough it might find some sport among the wild reindeer on this Scandinavian fell-range; and, as there are regular hunters here who live by it, he would soon, with a good guide, be able to get among these men, who would doubtless, for a consideration, help him. But I think he would have to go through a good deal of trouble and hardship before he killed his first reindeer, and the sport he would most likely meet with, would hardly com-

pensate him. However, he will see this sport very well and graphically described in "Barnard's Sport in Norway," to which work I refer him.

The Roedeer, as I have before said, is confined to a few woods in the very south of the country, and being private property, permission must be obtained before any are shot. It is reckoned that in the woods of South Skane upwards of 2000 roedeer are to be found.

The Wolf.—I know no regular method of hunting the wolf carried on here. Those which are killed are either by chance or in skalls. Some are taken in traps and pitfalls, and one plan they adopt is, for three men to drive round a frozen lake at night in a sledge with a pig. They make this pig squeal by pulling his ear, etc., and this attracts any wolves within hearing (for of all animals the pig is most liked for food by the wolf), who come down and follow the sledge often within gunshot. It is very clear that there are not half so many wolves in this country as is supposed. It is only in the winter that they come down into the midland districts, and they are very rare now. I recollect a few winters back three or four prowled around the town of Carlstad, and were often seen, but not one was shot. I observe very few wolf-skins in the winter markets at Carlstad, among the fox-skins which are brought down by the peasants from the north of Wermland, so I fancy they are not often killed. A wolf-skin here is hardly worth so much as a fox-skin. Except in Lapland, I never saw a wolf in any of my forest rambles.

The Lynx is also rare, but it is distributed sparingly over the midland forests, and as it is principally confined to the deepest forests, it is not often killed. We have a family at the present time in a forest not far from us, and they have done a good deal of damage. They are not unfrequently seen, but as yet not one has been shot. The way to shoot the lynx is to follow the spor in the snow with a good hound, when he will often tree.

The Glutton is almost entirely confined to the northern fells, and it is only by chance that one is killed, except by

the Laps. I have, however, known one or two killed in the north of Wermland or Dalecarlia. There is no certain method adopted for killing them.

The Otter is pretty common over all the country, but I never heard of any otter hounds here, which, however, would afford excellent sport, for in the banks of many of the small streams round us, I frequently see the otter's spor.

The Marten.—The pine-marten is not at all uncommon, and of all skins here it is the most prized. It is scarcely necessary to add that the winter is the only time when the skins of any wild animal are sought after, or of any value for fur. We always kill the marten with or without a dog by following the "spor" in the snow till it "trees," or takes refuge in the cleft of a rock. This is not at all difficult, although often tiresome work. A good marten-skin is worth from 10s. to 15s. I know of no regular professional hunters, at least such as get their living solely by the chase, like the trappers of North America, in fact there is not game enough in this country to support any man solely by hunting or shooting, and every peasant shoots a little just round his own house. I wonder, however, that they do not turn their attention to trapping more than they do, for notwithstanding all the devices one sees depicted in books on northern sporting, you rarely if ever see any in use, save just to take fish.

The Fox.—"Tally ho! hark away!" This cheery sound is never heard in these forests, where "old Charley" dies the ignominious death of a felon, without any funeral honours. It would be certainly impossible to follow hounds here on horseback, but in the early winter, when the ground is bare, a good deal of fun could be had with a few couples of beagles and harriers, in the chase of both fox and hare. The hunters of course must follow on foot with poles, and pick in as well as they can. Foxes are both trapped and shot here solely for the skins. In shooting them, the same kind of hound is used as for hares, only a little larger. As there is little to describe in such sport, I need dwell no longer on the subject, save to say that there are plenty of

foxes in these forests, and that a good skin is worth about 9s. or 10s. The Arctic fox is confined to the very fell tracts.

The Hare never hardly lies out in the open, in the midland districts, although you find them at form the same as in England, among rough grass in the south, and on the bare fells in the very north. With us they always lie in the woods, and a small kind of hound, of no particular breed, something like a terrier, is used to drive them. Hare-hunting is, *par excellence*, the sport of the Swede. There seems no particular art required, save a knowledge of where the shooter should station himself, as soon as the hounds have the hare up, for she always comes back to her starting-place. I always consider this hare-shooting very poor sport indeed, for these hounds drive very slowly, and often do not bring the hare back for hours, so if a man gets about a couple of shots in the day, he is well content. These little hare-hounds may be very clever in their way, but they run riot a good deal, and I have often thought that the caustic remark of an old English huntsman would apply to them very well, "It was principally *our* opinion that the hounds were running *hare* at all, they did not know themselves one half the time what they were running."

In an article in the last number of the "Swedish Sporting Magazine," on the decrease of game in Sweden, the writer gives us the result of 21 battues or skalls in Scania in 10 years, from 1842 to 1852, at which he was present (in which there were never less than 25, but generally from 25 to 50 men), and the whole number of animals seen and killed in the 21 battues amounted to (Listen! all ye English gamekeepers)—50 foxes seen, out of which 27 were killed; hares, 54 seen, 38 shot; 1 black cock. The best day's sport was 10 hares and 2 foxes. I think this will pretty well prove that the Swedish game laws require re-modelling.

The Squirrel.—In Lapland and the far north, where the skins are very grey in autumn, the squirrel is eagerly sought after, and 40 skins are worth perhaps 8s. In

the middle of the country, they are never so grey. In some districts there are a good many squirrels, but they are, however, always scarce in those forests where the pine-martens abound. Autumn and spring is the time to kill them for the fur.

It will be seen by the above list that the fur-hunter will find but little encouragement in Sweden, and there is no large game to tempt the English sportsman, save the bear and the elk, in these forests.

The feathered game will, however, afford him more amusement.

The Capercaillie was, I suppose, common once over all Scandinavia. Now, however, it is driven entirely out of the south of the country, and but few are met with, till we come up into the Wermland forests. From thence up to the North Cape they are, however, tolerably numerous even now, in those districts where the woods are not too much disturbed. Most of the male capercaillies are shot here—or, properly speaking, poached—in the spring, when they are playing with the hens, at the first dawn of morning. This play, or "lek," has been too often described to need repetition. It is certainly a very poaching way of doing the business, but still, if the old males are not shot till after they have played for a fortnight, and mated with the hens, (and the "lek" lasts above a month) not so much harm is done. It is very rarely that you find a brood of capercaillie out in the open, generally in the deep forests, and perhaps the only way to make sure of killing either them or black cock is to use such a dog as is broken to these forests, which springs them from their feeding-places on the ground, and when they perch, which they will soon do, especially if they are young, stands under the tree, and barks at them till the shooter creeps up and knocks them off their perch,—such shooters are very properly called in Sweden "kryp skuttare." This may seem a very unsportsmanlike way of killing them, but I really think it is the only way to get birds in these deep forests. Some of the old "kryp skuttare" are rare hands at calling. Such a

chap sallies into the woods with his dog in August and September, when the young broods can just fly. They are almost always on the ground in the day-time at this season of the year, and when his dog springs them they fly up and perch on the neighbouring trees. He now takes up his dog and sits very still for a quarter of an hour, when he begins to imitate the call of the young bird, to bring the old hen first within shot of him, for if he once gets her, the young birds are as safe as if they were in his pocket. After he has bagged the old hen, he then imitates her call, and the young birds come flying round him, often pitching on the very tree under which he is sitting. He need rarely leave his seat till he has cleared off the whole brood. Capercaillie, black grouse, and hazel grouse are all swept off in this way. This game, however, will not do after about September. The best day's capercaillie-shooting I ever had was in Lapland, when I killed in August seven full-grown birds (and all but one, fairly on the wing) in one afternoon.

I see by the "Sporting Magazine" that in the winter of 1862 between fifty and sixty loads of capercaillie, black game, hazel grouse, and willow grouse, were sent away from seven parishes in North Dalecarlia. Each load contained eighty brace of capercaillie, or if not they reckon four black grouse, and eight willow grouse, or hazel grouse, to each brace of capercaillie. So there is still a good deal of game in some of these northern provinces. These were all trapped or shot by the peasants, who principally use "lod bössa," or small pea rifles, rarely a shot gun.

The Black Grouse is met with every where from the very south of Scania, and on some moors there is excellent black game shooting in the open. But in the midland and northern districts we rarely find them in the open, except in long heather, just outside the forests, in the early part of the season. With a good setter, I have no doubt a man might pick up a good many odd brace in the open patches of heather in and about all these forests; but after that he must look for them in the forest, and use such a dog as I have before recommended. I have sometimes fallen in

with a covey of black grouse on one of the islands in the Wener when duck-shooting, in August and September, and had some very nice sport.

The Hazel Grouse.—This, to my fancy, the finest of all our forest game for the table, is never met with in the south of Sweden, but from the south of Wermland far up into Lapland, it is common in all the thick woods, especially such as have stony rises in them. They are never seen in the open, but occasionally in the thin woods of birch and fir mixed, which skirt the deeper forests; their principal home is deep old rocky fir forests. I see the Acclimatization Society are desirous of introducing this bird into England, but in my opinion it would never thrive in any English forests which I have seen, (and of the Scotch forests I know nothing). Small belts of fir would not certainly, however, suit the habits of the hazel grouse. Moreover, there is no bird so difficult to rear in confinement. They are never seen in a tree until they have been frightened up from the ground, and the only plan by which I have ever shot them has been to hunt them up with one of the beforementioned hounds, and shoot them at perch, for they never fly far. Their call is a soft whistle, and, with a little metal pipe, no bird is more easily called to the shooter.

The Ptarmigan is only met with on the snow fells, and I suppose no further south than the Dovre fell. From the little experience I had up in Lapland, I should say ptarmigan shooting, with a brace of high ranging setters, on these fells, must be the finest kind of shooting, and it brings a man among scenery which he never forgets. I am certain on some of the Lap fells, a man might kill twenty-five or thirty brace in a day with ease.

The Willow Grouse comes much further south, even into North Wermland, and it is certainly the commonest of all game in the forests at the foot, and on the sides of the fells, right up into Lapland; but they never wander far, and the sportsman will not find them in any of the forests, which lie at a distance from the true fells. A good setter, with a bell, would be the dog for this work, but he should

not range too wide, or a well-broken Sussex spaniel, well under command, might answer in shooting these forests. The willow grouse generally frequents pretty open places in the forests, especially near water where there are bushes, and I noticed that all the Lap forests which I saw, were much more open than those in Wermland; and a man has a much better chance of a flying shot than with us, for if he does chance to tramp up a bird from the ground in our woods, it is out of sight before he can get up his gun. There is no telling what quantity of willow grouse a man could bag in an August day in some of these Lap forests. Unlike all the other forest game, the willow grouse never perches on a tree and when sprung soon drops again.

The Partridge.—I have seen as good partridge ground in the south of Sweden, (barring the turnips) as ever I saw in England, and I am certain in some places a man could make as heavy a bag as in Norfolk; but in the south, most of the gentlemen shoot themselves, and since the deep snow in 1860-61, we have had no shooting worth speaking of in Wermland, which we may, in a sporting point of view, say, is the northern limit of the partridge in Sweden, although before 1860, a good many used to be found around Fahlun. With us they thrive very well, and if I had an estate here I would soon have them back again, for I would buy up a lot of birds from Scania in the autumn, where they net them, keep them under cover through the winter, and turn them out in the spring; and if there were a deep snow in the winter, I would net all the covies I could, (and this could be easily done, for at this time they come right up to the dwellings), keep them through the winter, and turn them out again in the spring. It is strange no landed proprietor does this. They are all complaining of the scarcity of game, and yet few will go to any expense or trouble in preserving it, and consequently in this land, which, by nature, is better adapted for most kinds of game than any I know, a man has the greatest difficulty in making a heavy bag.. I dare say, however, that the severity of the winters, and the abundance of foxes and birds of prey, tend to keep them down a good deal; but how

can any one expect a good show of game where there are no real gamekeepers, and every peasant is a poacher?

The Quail is so rare in Sweden as hardly to be worth noticing in this list. Land rails, however, are common everywhere.

The Woodcock and Snipes.—We now come to a class of birds that are more independent of man, than any of those we have mentioned, and not so easily shot out. The woodcock does not go up into Lapland, and the principal breeding haunts are the midland forests. The crack woodcock shooting is certainly on the southern and western coasts, during the periods of migration, especially in the autumn. The coverts there are better suited to them than our midland forests, and as we only find them before they pack, we never make much of a bag in Wermland. I recollect some years ago dropping in with a large flight in Scania, in the end of October, and, if I remember right, I bagged twenty-one woodcocks, one hare, and one black cock, and left off for want of powder. I got them in a large patch of oak stubs of perhaps a hundred acres, and I saw so many birds, that I am sure I could have bagged twenty-five brace to my own gun, had light and ammunition served me. Next day I beat the same ground well, and did not see six couple of cocks. The wind had shifted in the night. I generally shoot them here when they are roading, and in a good stand can often kill three or four in an evening. A friend in Gothenburg wrote me word that, in the spring of 1864, he killed forty woodcocks round that place when they first came over. I know there is some pretty good cock ground round Gothenburg.

The Great Snipe.—There is something mysterious about this bird, and there is no telling with any certainty here how many you may bag in a day. Whether they are decreasing in numbers or not I cannot say, but this I know, we see very few now in the middle of the country. I never yet found out rightly where they chiefly breed, but I am certain some at least do in the middle of the country, for I have received the eggs from North Wermland, and shot very young

birds in our meadows; and a friend of mine this year took two nests near Gothenburg. Upsala is a great place for the double snipe, and they must breed there in considerable numbers, if it is true as we read, that in one May very ately, eight hundred of these birds were sold from this district. As these were all shot on their playing grounds just before laying, we need not much wonder that they are yearly becoming scarcer. The best afternoon's shooting I ever had was in a rough tussocky meadow not far from this. I bagged seventeen; but I believe Mr. Lloyd has done more in the Gothenburg marshes, where even now there is at times a tolerable sprinkling. They come down to us the earliest of all the snipes, and leave the soonest. I generally expect to find the first about the middle of August, and I never kill one after September. They do not lie in the wet like other snipes; dry tussocky meadows, but not far from the water, is the place to look for the double snipe. I think they are a very local bird. I may here remark that all the snipes on their downward passage follow the course of the large rivers, by the sides of which there is usually capital snipe ground. Every one knows how uncertain are their habits —here to-day, and gone to-morrow. If a man had the luck to fall in with a heavy wisp, I dare say he would make a great bag here. I have two very good grounds in my neighbourhood, but I never shot ten couple in the day on either of them, though, with a good dog, I dare say that might be done without much trouble; but whenever I go, I can always make sure of five or six couple, and I could shoot both grounds, I fancy, on alternate days, from the beginning of September, to the middle of October, with the same results.

The snipe in Sweden are very local, and lie much in small wisps, and rise together. I know one tract of splendid meadow, about five English miles long, every yard of which looks excellent snipe ground; but, strange to say, there are only about five places on all this ground where the snipe lie. They appear to lie in much wetter ground here than in England, probably on account of the warmth of the season when we shoot them. The common snipe begin to draw down

early in September, the jacks scarcely till October; and although you may flush a few jack up to the middle or even the end of October, the cream of our snipe season ends in the middle of October.

Wild Fowl.—The common ducks in our midland reeds are the wild duck, the teal, and the widgeon; but the former is by far the commonest. All three breed with us in Wermland, and no others, except the mergansers. One part of the country is admirably adapted for flapper shooting—immense reed beds, and long, marshy grass; and about the end of July, when the birds are pretty strong flyers, a man may with ease kill ten to twelve couple in any day, if it is a fair season. But much depends on the boat and man you have to help you. A boat is indispensable for duck-shooting here; for although there are many places where you can wade, most of the birds lie out by day in the rushes and reeds, that fringe the lake or river. A flat-bottomed boat, rather snipy at the end, which draws very little water, but will still hold two comfortably, is the best sort; and if you have a good man to help you, without making too much noise, you may often have a rattling day's sport. The narrower the boat, the better, of course, she goes through the reeds; a big heavy punt is always getting stuck, and the man makes so much noise pushing her along that the birds hear it, and rise up from all parts of the reeds out of shot. A dog, unless he is a good retriever, is of very little use for this work; in fact, he often does more harm than good. A man who does not mind wading will always get most sport; but water-boots are not of the slightest use here, for you must nearly always be half-way up your thigh in the water, and every now and then you slip into a hole up to your waist. A man must be very cautious when wading in ground which he does not know well. Towards the middle of September the ducks get very strong and wild, and the water then becomes too cold for wading without boots. The old mallards are assuming their full plumage again, and when a shot is fired the ducks rise from all parts of the reeds. About the end of September they begin to

pack, leave the reeds, and large flocks assemble by day in the open waters. It is now impossible to approach them without a punt gun, and that would be hardly safe in our large lakes. Towards the middle of October the golden eye comes down, and many stop in the large rivers till very late in the winter. The weather now begins to get chilly and inclement, and the duck-shooting in Sweden may be considered as over; and with it the shooting season may be said to close in the midland districts, except for hares or an odd shot at forest game. I never could tell which way the scoters, and scaup, or geese, come down from Lapland. It must be along the coast, for they certainly do not pass through the midland districts; and the same remark will apply to most of the waders. We rarely see any wild swans in our district, but plenty of diving ducks, and many waders, especially ruffs and reeves; the geese only visit us in the spring and autumn.

I have above given the reader a list of what game he may expect to find in Sweden, and I will now say a few words on the fishing; a few general hints on this subject will suffice. For all the common fresh-water fish such as we have in England the angler cannot go wrong, let him camp where he will; and I need not give him any advice as to the tackle, etc., required, for just the same as is used at home will do here. To the salmon-fisher I can only say that none of the Swedish rivers appear to equal the Norwegian. The salmon-fishing on the few rivers in the south is now, I believe, all taken up; but I fancy all the rivers on the eastern coast north of Stockholm are free. However, from all accounts it does not appear that there is any very great sport to be had in these rivers. Still salmon must and do come up all the rivers, that have an outlet into the Baltic, but I do not believe they have been tried regularly like the Norwegian streams; and if I were a devoted salmon-fisher, and well off, I would come up to Stockholm in the end of May, hire a good guide, and proceed from river to river up the coast, see what the salmon-fishing was like, and then hire the stream. I am certain I should find many a good

fall, for it is impossible that such magnificent rivers as one sees all the way up between Stockholm and Happaranda, can be without fish. I suppose the Norwegian tackle and flies would suit all these waters, and I should certainly try spinning. The large lake trout are met with in all the great lakes, and are always taken by spinning; in all the Lap waters charr, grayling, and trout abound. Almost all the streams in North Wermland are full of trout, and charr are met with in all the fell lakes. I should certainly recommend any man who wished to fish the Lap lakes properly, to bring up a portable boat large enough to hold two well. I cannot fancy any place where a party of real sportsmen, properly equipped with tent, provisions, etc., could spend so happy a summer as camped out on the Lapland fells. As with the game, so with the fish, very little care is taken to preserve them, and the consequence is, that a man does not get the sport in Sweden that he expects. Still there is good fishing in many places yet to be obtained; and to prove this, we need only refer to Mr. Lloyd's Scandinavian adventures, in which he gives us the result of his fishing at Ronnum, a little south of Wenersborg, with *the rod*, during one particular season—in all, 580 fish (including 120 lake trout, weight, 1796 lb., and 364 pike), which weighed 2864 lb. I know the fishing at Ronnum is not what it was in his day, but this I also know, that there are many places as good now, if a man only hits on the right one, and much good shooting to be had, if he were to hire a large manor, and go to a little expense and trouble in preserving his game. The salmon do not ascend the Swedish rivers very far, on account of the numerous water-falls, and consequently they are not taken far from the sea; but as I have before said, trout and grayling are to be met with in all the streams in North Wermland and Dalecarlia, and certainly that is about the best district for an English sportsman to pitch his tent, in Sweden. It is reached without difficulty, and I am sure a good season's sport might be had there by looking about. As it has not become the fashion for Englishmen to hire either fishing or shooting yet in this country, this is just the very

time for a man to find out a good stream or manor; and that both these are to be found in Sweden, as well as in Norway, I am pretty certain. Although I do believe that, from some cause or other, of which we are ignorant, the rivers running into the Bothnia or the Baltic, on the eastern coast of Sweden, are none of them such good salmon streams as those on the west coast of Norway, still I do not think we are yet in a position to speak of their capabilities, for so few of them have ever been tried, with the rod and line in good hands. There are some capital falls in both the Lulea and Tornea rivers, where we know that lots of salmon run up; and why should they not come up other rivers, of which there are so many between Stockholm and Tornea?

Respecting the Norwegian salmon rivers, I cannot do better than quote the following excellent remarks from the pen of a correspondent in "The Field" of August 20th, 1864; and as they formed the conclusion of a capital description of a visit to Norrland in 1863, we may rely upon their correctness. He says:—

"From all I can gather, and have seen, I do not think Norwegian salmon-fishing repays the trouble, and time, and cost. The best rivers, as the Namsen and Alten, for example, will give from 1200 lb. to 1800 lb. of salmon a rod, and to catch this requires an absence from home of at least three months. Any tolerably good Scotch river will give as good results in the same time. The fishing is not at all, in a general way, of the sort that I, as a sportsman, like. It is nearly all—particularly in the best rivers—from a boat, and I can make out but comparatively few rivers which are fished from the shore. This is somewhat the fashion of the rising generation of salmon-fishers: lounging back with his legs well up, a huge regalia projecting like a bowsprit from his bow incessantly, with the last horrible sensation novel in his hand; he has a rod stuck over each side of the boat; and he is rowed about, to and fro, backwards and forwards, until a fish takes it into his head to seize one of the flies, when a

temporary excitement takes place, to be duly succeeded by temporary calm.

"Norwegian salmon-fishings are getting dearer, and the obtainable ones, as a matter of course, scarcer every year, as the tide of English fishermen swells higher and higher. The great point in favour of the Norway fishing, is the chance of catching a big one, a forty-pounder, which will serve to talk about for life; but I hope that the mitigation of bag and stake nets, and the opening of weirs, and the enforcement of a weekly slop on our own rivers, will, in time, put even this advantage at a discount. There is plenty of salmon-fishing in our own favoured land—if it were only managed with the least reason and judgment—to find ample sport for every salmon-fisher in the kingdom, and at a reasonable price to the fisherman, too—of that I am perfectly certain. The present and late high prices must go down in a few years. Scores and scores of Irish rivers, comprising hundreds of miles of fine fishing water, hitherto sealed up tight, and not worth the wagging of a rod over, will come into the market and compete with Norwegian and Scotch. I would only instance one or two as examples, which have often been quoted in "The Field."

"Look at the Shannon, the Moy, and the Blackwater; these are splendid rivers. Shannon salmon-fishing has been a mere myth. The Moy has been, by close fishing, reduced to a trumpery grilse stream, where the fish average some three or four pound apiece, and, save under accidental circumstances, it is not worth throwing a line above the weirs at the mouth; yet there is an immense extent of splendid river above this, with huge lakes as refuges for the fish to back it, and which formerly, before the weir was built up, produced very large fish, and was capable of finding sport for innumerable anglers, all of which has hitherto been shut up and is unproductive of any sport. The same may be said of the Blackwater, which I see is now being attended to by the commissioners—good luck to them! And this is being done all over Ireland, and the consequence will be that in a very few years, vast tracts of fishing ground which have

never yet been available will become so. Something like this, in a smaller way, will also take place in Scotland, while the English and Welsh rivers are slowly but surely looking up, and will in time contribute their quota to the sport of the country.

"I am greatly in hopes that in time, much of the gold that now fertilizes the hungry and greedy Norse peasant, may be diverted into more legitimate channels. As regards salmon-fishing in Norway, I would not advise any one to go there *upon spec.*, or he may be pretty sure to reap disappointment. It requires almost as much preliminary care and caution, as does the taking of a grouse-shooting, to ensure a good chance of sport. But if the tourist can be satisfied with trout-fishing, that, he can have in wonderful perfection and profusion. Towards the Swedish frontier it is abundant and extraordinarily fine—in fact, it is of itself worth coming for, for many of the lakes and streams in the interior hardly ever see a rod. The mosquitoes, etc., are, to be sure, rather a drawback; but 'what can't be cured must be endured,' as the old proverb has it. Shooting is very good, if you know where to go for it. K. recommends some of the islands as far north as Tromso. At Carlso he once killed forty brace of ryper in the day to his own gun.

"All sporting requisites the angler would do well to take with him, but he need not trouble himself with comestible stores. These he can get at Trondhjem, Bergen, or Christiania, quite as good as in England, and very nearly as cheap—indeed, carriage and all considered, they come quite as cheap in the end. An interpreter is indispensable, but I would advise all tourists to get together a few ordinary phrases—of course, the more the better. Trusting that my brother anglers may be able to derive some small profit from my experience, I, in conclusion, wish them better sport than I had."

CHAPTER V.

On the Scandinavian Fauna, with a complete List of every Quadruped, Bird, Reptile, and Fish, met with in Sweden, Norway, Denmark, and Finland at the present day.

I HAD some difficulty in deciding how I should set about this part of my task; for to write anything like a detailed account of the Scandinavian fauna would have far exceeded my present limits. I could, it is true, in a very short space, have given a mere list of all the animals met with in this wide-stretched continent, but I deemed the subject of too much importance for so short a notice, more especially as I had some few remarks to make on many of the different species, especially the birds and fishes, from my own personal observation. Upwards of ten years collecting in the North has rendered me pretty conversant with the northern fauna; and although I have always been well supplied with the best works on the subject, there was one other of which I have often felt the want, and that was a clear and concise description of every animal in the country, which would enable a field naturalist like myself, possessing a slight knowledge of classification, to decide at once to what species any specimen belonged, which he might obtain in his rambles. I have no doubt other collectors as well as myself have also felt the want of such a book, which would give them in a few lines such a short description of the leading characteristics of a species, (which could be better relied upon than the colour alone) without the trouble of referring to more elaborate works, and wading through a page of description, to find out what a few words would tell them at once. And when I was engaged in compiling a list of the animals of the North, I deemed

that it would not be a waste of time if I added a short description of each species. I believe this chapter will be found of use to the British, as well as the Scandinavian naturalist, as many of the Scandinavian species belong to the British fauna.

Whether or not this list will prove as useful to the field naturalist, as I confidently anticipate that it will, I can answer for one thing, which is, that it will be found to contain the best, if not the only complete account of the fauna of the north of Europe, which has ever been laid before the British naturalist; and I trust that as a work of reference in establishing the geographical limits of different species, it will be valuable to zoologists of all classes.

Of course I cannot lay claim to much originality in this part of the work. It is, in fact, a compilation from beginning to end; but nevertheless, a compilation prepared with an immense deal of trouble, labour, and close attention. To take Nilsson's "Fauna" in hand, and merely give a list of such animals as are met with in Scandinavia, would have been a very simple affair, but to refer to the best authorities on the fauna of four large northern countries, as well as of Great Britain, to compare them with each other, to see how far their observations tallied with my own experience, and then to pick out from all, the best and shortest account of the different species, with its easiest and most reliable specific distinctions, was a work of no little labour. It is, however, now done, and if any trifling mistakes have crept in, which is probably the case, I trust they will be kindly overlooked by the reader. They are not many, I am certain, for I have taken every possible pains with my task. However, as Dr. Johnson wisely observes, "He that has much to do will do something wrong, and of that wrong must take the consequence." I am therefore induced thus early in the day to throw myself upon the kind consideration of the reader, and beg him to overlook any little inaccuracies which he may detect, not only in this, but in the foregoing chapters, for my task throughout has been one of no ordinary labour.

Before commencing this list, I beg to make my acknow-

ledgments to the authors of those works which have alone enabled me to complete it; and first I must mention Professor Nilsson—a name well known to every British naturalist—to whose pains-taking and excellent treatises on every branch of the vertebrated zoology of Scandinavia, I am principally indebted for the information contained in the following pages. It will be gratifying to all true naturalists to learn that this good old man and devoted naturalist, is still alive and hearty, after more than half a century spent in the good cause, that of imparting knowledge to others in one of the noblest sciences to which man can turn his attention; and all I trust is, that he may yet live some years to enjoy the hard-earned reputation to which a laborious and usefully spent life have so well entitled him. Kjärbölling's "Danish Birds" and Kroyer's "Danish Fishes," both excellent works, have been my principal guides to the study of the Danish fauna, while Wright's "Birds" and Malmgren's "Fishes," of Finland, both lately published, have enabled me to lay before the British naturalist an account of the bird, and fish fauna, of a land but little known. To many private friends I am also indebted for assistance, and a ten years' close study of the northern fauna, has enabled me to perform my task without entirely relying upon others for assistance. I have also given a list of the birds of Greenland and Spitzbergen, from the latest and best authorities.

I may add, that throughout this whole list I have strictly followed Nilsson's arrangement, not because I consider it altogether the best, but because I fancied it would be the most interesting to the British naturalist. The measurement in every case is Swedish, but there is only this difference between the Swedish and English foot, that the latter is longer by five-sixteenths of *an inch*. The reader will, however, see that my measurement of Swedish specimens, often differs from that given by British authorities.

Scandinavia, throughout the whole work, means Sweden and Norway.

The letter D. denotes that the species is also met with in Denmark, as the letter F. denotes that it is met with in Fin-

land. The most common Swedish names and Latin synonymes have been used, and when the English name is given, it shows that the British and Scandinavian species is identical, except it stands in parenthesis, when it denotes that the species is not met with in Britain, although well known by an English name.

CLASS I.—MAMMALIA.

THE Scandinavian mammalia may be divided into the following orders:—

I. Extremities armed with claws.

a. With three kinds of teeth—incisors, molars, and canines.

1. With extremities formed for flying.—*Cheiroptera.*
2. With extremities formed for walking—nose elongated to a pointed snout; molars all alike, with several points.—*Fossores.*
3. With extremities formed for walking—molars of three kinds.—*Feræ.*
4. With extremities formed for swimming—molars of one kind.—*Phocaceæ.*

b. With only two kinds of teeth, canines wanting.

5. Incisors $\frac{2}{2}$, long, curved, and sharp-edged—molars all alike.—*Rodentia.*

II. Extremities furnished with hoofs.

6. Non-ruminants.—*Pachydermata.*
7. Ruminants.—*Ruminantia.*

III. Extremities furnished with fins.

8. Body naked, formed with horizontal tail-fin.—*Cetacea.*

I.—*Quadrupeds whose extremities are furnished with claws.*

ORDER I.—CHEIROPTERA. BATS.

Provided with membranous wings. Genus *Vespertilio*, L. I., $\frac{4}{6}$; C., $\frac{1}{1}$; P., varying; M., always $\frac{3}{3}$.

A.—With divided ears.

1. Ear thick, opaque, much shorter than head; tragus shorter than half the ear; præmolars above 0 or 1, below 1. *Vesperugo*, Keys. and Blas.
   a. Præmolars above 0, below 1.
   b. Præmolars, above 1, below 1.
      (*a*). The upper præmolar is not apparant outwardly, for the hinder edge of the canine tooth joins on to the furthest jaw tooth.
      (*b*). Upper præmolar outwardly apparent.

2. Ears thin, transparent, a very little shorter or sometimes a little longer than the head. Tragus longer than half the ear. Pointed præmolars, $\frac{2}{2}$.—*Vespertilio*, Keys. and Blas.
   a. Ears shorter than the head.
   b. Ears longer than the head.

B.—Ears grown up together on the forehead.

1. Ears much longer than the head, thin and transparent. Præmolars, $\frac{1}{1}$. *Plecotus;* Geoff.

2. Ears shorter than the head, thick, and opaque. Præmolars, $\frac{2}{2}$.

GROUP 1.—With Divided Ears.

Gen. *Vesperugo*, Keys. and Blas.

Thick-eared bats. Flädermus, Swedish. Ears much shorter than the head, broad and thick. Tragus shorter.

1. VESPERUGO MURINUS, L. Grä skymlig Flädermus. The Parti-coloured Bat. D. F.

Length, 2 in. 4 l.; fore-arm, 1 in. 6 l. Colour, above shiny grey; grey-black beneath; white on the under sides; cheeks and forehead black. Tragus broadest above, and obliquely rounded. Commonest of all the bats in the middle and south of Sweden, and found as far north as Upland at least.

Professor Bell gives the synonyme of *V. Murinus*, L. to the British mouse-coloured bat, which is not known in Scandinavia.

There is still some confusion in the identification of our European bats, and much of this would be obviated if all our principal naturalists would agree to adopt and use one or at the most two synonymes for each species. We have a case in point in the bat now before us. Two great authorities, Bell and Nilsson, dispute to which species Linneus' synonyme of *V. Murinus* strictly belongs. I think Nilsson is decidedly right in claiming it for this species, because Linné would hardly have described a species in his "Fauna Suecica" under that name, unless it had been known in Scandinavia, and the British mouse-coloured bat is not. In describing this *V. Murinus*, L., Nilsson uses all the following synonymes:— *V. noctula*, Retz. (now here is confusion again, for the great bat, quite another species, is the *V. noctula* of some authors), *V. pipistrellus*, Retz. and *V. discolor*, Natt.

2. VESP. BOREALIS, Nilss. Nordisk Flädermus. F.

Length, 2 in. 2 l.; tail, 1 in. 5 l., protrudes further than in the last; wing, 11½ in. broad. On the back, a large yellow-brown or grey spot, encircled with black; under parts grey-black. Tragus, smallest at the tip.

Resembles the last very much, but differs in being smaller, the nose longer and sharper, and the ears being higher and more transparent. Tragus is smaller, and the hair is longer.

Is sparingly distributed over the whole country, and seems to be the only species which is met with in Lapland. I have frequently killed it in South Wermland.

3. VESP. NOCTULA, Daub. Stor Brun Flädermus. The Great Bat. D.

Length 3 in.; fore-arm 2 in. 1 l. Colour, yellow-brown, above a little duller, underneath rather paler; nose, ears, and wings, blackish; hair paler at the roots. The under side of the wing, along the arm, thickly covered with hair. Tragus broad and rounded.

Is sparingly distributed over the south and middle of Sweden, as far up at least as Smaland, but no further.

4. VESP. NATHUSII, Keys. and Blas. Nathusius' Flädermus. D.

Length about 2 in.; forearm 1 in. 2 l. Rusty brown, head above, rather duller, under parts dull yellow-brown; hair from the root to three-quarters of its length blackish; ears of the same height, and breadth 2¼ l.

Is probably often confounded with the *V. pipistrellus*, but is nowhere so common. As yet it has only been met with in Scania, and that rarely.

5. VESP. PIPISTRELLUS, Daub. Liten Brun Flädermus. The Common Bat. D. F.

Length 1 in. 6 l.; tail 1 in. 2 l.; breadth of wing 8 in. 6 l. Body above of a uniform yellow-brown or soot-brown colour, under parts a little paler; hair blackish from the root to the middle; nose blackish; ears and interfemoral membrane black; ears oval 2 l. high; tragus small, of an even breadth, and rounded off.

Is the commonest of all the Scandinavian bats, at least as far up as Stockholm and Bergen in Norway.

Nilsson observes that he has seen the specimen of *V. pygmæus* in the British Museum, which is described by Bell as the pigmy bat, and he is satisfied that it is nothing more than the young of the common bat.

Gen. *Vespertilio*, L.

Thin-eared Bats. Nattblacka, Sw. Ears never shorter than the head, thin and transparent, and pointed.

6. VESP. MYSTACINUS, Leisl. Mustascherad Nattblacka. The Whiskered Bat. D.

Length 1 in. 7 l.; tail 1 in. 4¼ l.; forearm 1 in. 3 l. Interfemoral membrane with ten to twelve distinct transverse lines, but with no fringes; ears as long as the head, black, nearly transparent; tragus longer than half the ear, pointed, colour above blackish or chestnut brown, under whitish; upper lip furnished with a moustache of long fine hair, whence its name.

Is rare in Scandinavia, and confined to the south and south-east provinces.

7. VESP. DAUBENTONII, Leisl. Daubenton's Nattblacka. Daubenton's Bat. D.

Length about 2 in.; tail 1 in. 4 l. Colour above reddish grey, below whitish. Interfemoral membrane without streaks or fringes; ears shorter than the head, indented on the outer edge, transparent, as well as the tragus, which is lancet-shaped, and half as long as the ear; lower canines not higher than the molars.

Vesp. emarginatus, Jenn., the notch-eared bat, according to Nilsson, is this species.

Has hitherto been met with only in the south and south-east provinces of Scandinavia. I have, however, this year obtained specimens from Wermland.

8. VESP. DASYCNEMUS, Boie.

Colour, size, and form much resembling the last, but the edge of the ear is plain in the middle; tragus not so long as half of the ear, and very slightly tapering; interfemoral membrane partly clothed with hair underneath; third joint of the third finger shorter than the second joint; lower canines higher than the molars.

Has only lately been added to the Scandinavian fauna. Common in Denmark.

9. Vesp. Nattereri, Kuhl. Natterer's Nattblacka. The Reddish Grey Bat. D.

Length 2 in.; tail 1 in. 4 l. Interfemoral membrane with five or six transverse lines, on the edges fringed and hairy; ears the length of the head, slightly notched as well as the tragus, transparent; tragus narrow, lanceolate, longer than half the ear; colour above dark greyish black, below whitish.

Not rare in the south and south-eastern provinces.

Group 2.—Ears grown together on the Forehead.

Gen. *Plecotus*, Geoff. Läderlapp, Sw.

Ears much longer than the head.

10. Vesp. Auritus, L. Lång Örad Läderlapp. The Long-eared Bat. D. F.

Colour above dark greyish black or rusty grey; below paler grey or whitish rusty grey. Length 2 in.; tail 1 in. 6 l.; wing breadth 10 in. Ears twice as long as the head; tragus lanceolate, a little shorter than half the ear; forearm much shorter than the fifth finger.

Nilsson remarks that the *Plecotus brevimanus*, Jenn., the type specimen of which he has seen with Professor Bell, is nothing more than the young of this species.

Is met with over all Scandinavia, from the very south to ar into Norrland.

Gen. *Synotus*, Keys. and Blas. Barbastell, Sw.

Ears shorter than the head, thick and opaque; a hollow naked place on the upper surface of the muzzle, in which the nostrils are placed; these latter open on the top of the nose.

11. Vesp. Barbastellus, Daub. Svart Barbastell. The Barbastelle. D.

Length 2 in.; forearm 1 in. 4 l. Colour black above, under blackish brown; ears broad, a little shorter than the head, notched on the outer margin; tragus small, longer than half the ear; nose above hollowed and naked. The peculiar face of this bat distinguishes it from any other.

Is rare in Sweden, and not met with further north than Scania and Blekinge.

Not a single species of *Rhinolophus*, or horse-shoe bat is met with in Scandinavia.

ORDER 2.—INSECTIVORA.

Snout much prolonged; incisors varying in number; the summits of all the molars with conical points; feet armed with strong claws; eyes small.

Fam. 1.

Canine teeth above much higher than the incisors. Fore feet shovel formed, naked, directed outwards; all the upper incisors of the same length.

Gen. *Talpa*, Moles.

I. $\frac{6}{6}$, P. $\frac{3}{3}$, M. $\frac{4}{4}$. Snout conical; eyes small; legs and tail short; fur very thick, fine, and silky.

12. Talpa Europea, L. Mullvad. The Mole. D. F.

Length 6 in.; tail 1 in. Colour black-grey, glossy; eyes very small; no outward ears.

Common in the very south, and although it is met with as far up as the Dovre fell in Norway, I can't say I ever saw it in the midland districts, where they confound the water-shrew with the mole, as they have both the same Swedish name.

Fam. 2.

Canine teeth much lower than the two middle incisors.

Gen. *Sorex*, L. Shrew Mice.

(*a*). Præmolars above, 5.

Snout pointed. Body clothed with soft silky hair; tail thin, long; feet slender.

13. SOREX VULGARIS, L. Allman Näbbmus. The Common Shrew. D. F.

Length 2 in. 6 l. to 3 in.; tail 1 in. 3 l. to 1 in. 5 l. Ears short, totally hidden in the fur. Colour, above dark grey brown; below pale grey; sides rusty grey; tail brown above; paler under; head as long as half the rest of the body. But they vary much in colour as well as size.

Is common all over Scandinavia.

14. S. PYGMÆUS, Pall. Tjock svansad Näbbmus. F.

Length 1 in. 7 l.; tail 1 in. 3¼ l., without the hair pencil at the end, which is 2½ l. Tail thick; reaches to the ears when it is laid back, with open hair, through which the rings are seen; obtuse at the end. Colour, dark brown above; under white-grey.

Has lately been added to the Swedish fauna from specimens taken in Scania. I have met with it in South Wermland. It is, however, rare everywhere. Native home, Siberia.

The greater proportionate length of the thick blunt tail will always serve to distinguish this species from the young of the last.

15. S. PUMILUS, Nilss. (N. Sp.) Dverg Näbbmus.

Length 1 in. 4½ l.; tail, without the hair tip, 1 in. 2½ l.; thin; when laid back reaches to the eyes; covered with long hair, through which the rings do not appear; ends with a pointed hair pencil; head as long as the rest of the body. Colour, above rusty grey-brown, below white.

Added to the Swedish fauna from a single specimen taken in Scania.

Nilsson remarks that this little mouse may be taken for the young of the last, but the feet are too slender, and the tail appears too long.

Clermont does not mention it in his European mammalia.

(*b*). Præmolars above, 4.

Gen. *Crossopus*, Wagl.

Teeth coloured at the tips; the two middle incisors below with a plain edge. Fourth molar very small.

16. S. Fodiens, Pall. Vatten Näbbmus. The Water Shrew. D. F.

Length 3 in. 4 l. to 6 l.; tail 2 in. 2 l. to 4 l. Black above; below white or grey; tail longer than half the body; wrists and toes covered with bristly hairs; hind feet broad.

Common over all Scandinavia, from Scania to far up into Lapland, where, however, it is rare, for I only obtained one specimen, and this at Iockmock.

Fam. 3.

Front feet small, body covered with bristles, under them fine wool; snout obtuse.

Gen. *Erinaceus*, L.

17. Erinaceus Europæus, L. Igelkott. The Hedgehog. D. F.

Ears shorter than half the head, hidden; upper parts dark grey; below grey-brown. Length 10 in.; head 2 in. 2 l.; tail 1 in.

Said to be common in the South, and to go up as far as Westmanland. I, however, never met with a specimen in any part of Scandinavia, or a mole either. Clermont says: "Met with in all Europe save Norway and Lapland." Nilsson says: "In the South of Norway it is not rare."

ORDER 3.—FERÆ. (Beasts of Prey.)

With three kinds of teeth; six incisors in each jaw, except in some of the seals. Feet armed with claws.

A.—Tuberculated teeth, $\frac{1}{0}$ or $\frac{1}{1}$. 1. Tuberculated teeth, $\frac{1}{0}$.

Gen. *Felis*. Cats.

Head rounded; eyes large; pupil of the eye vertical; five toes on the fore feet, four on the hind feet, all armed with sharp, crooked, retractile claws; tongue rough.

18. FELIS DOMESTICA, Briss. Tam Katt. The Domestic Cat. D. F.

Is common in all parts of Scandinavia wherever man lives in houses, but it does not thrive in the Laplanders' tents. Body 22 in.; tail 10 in., tapering.

Singular that the wild cat, which may always be distinguished from the last by the thick blunt tail, is not known in Scandinavia, nor are fossil remains ever dug up in any of the turf mosses. Nilsson is of opinion that all the tame cats in the north of Europe have sprung from the European wild cat, yet he cannot help acknowledging that the "foramina incisiva" in the common Swedish cat are always oval, never round, as in the South European wild cats.

19. F. LYNX, L. Lo. (The Lynx.) F.

Colour grey or brown, covered with more or less distinct black spots; tail on the outer half black; length 3 to 4 ft.; height over the withers, 2 ft.; tail, 9 in.; ears, $3\frac{1}{2}$ in., with a pointed tip of hair, $1\frac{3}{4}$ in.

Varieties.

(1). *F. Cervaria*, Tem. Kattlo.—Body covered with black spots all over on a grey ground, forming on the back three longitudinal rows.

(2). *F. Virgata*, Nilss. Varg Lo.—Body covered with smaller and much less distinct spots on a red ground, forming two longitudinal rows along the back. This is, in fact, nothing more than the summer dress of the last.

(3). *F. Lynx.* Raf Lo.—Body without spots or streaks, except a few small spots on the thighs; colour reddish even in the winter.

It was formerly considered that these three varieties were distinct species, but it is now pretty clearly proved that they are nothing more than varieties in colour of the common *felis lynx*, or "raf lo." Is nowhere common, and, unlike the wolf, is not gregarious; a pair or a family will take possession of a certain forest district, and keep it. Is rarely, if ever, met with within the polar circle, and never in the very south of Sweden. The principal strongholds of the lynx are the large rocky forests in Helsingland, Dalarna, and Jemtland; never seen on the fells. Pair in February or March, and bring forth young early in June; two but sometimes three, which very soon learn to follow the mother. The lynx can climb like a cat, and is one of the most destructive beasts of prey in these forests.

2. Tuberculated teeth, ┼.

Mustelina.

(*a*). Upper tuberculated teeth of an equal breadth.

Gen. *Gulo*, Storr.

Head oval; body long; legs short; tail longer than the head; foot soles hairy.

20. GULO BOREALIS, Nilss. Jerf. Fald fras. F. (The Glutton.) F.

Along the back a black patch encircled on the sides with yellow brown; general colour black, with a rusty tinge on the sides of the body and head; legs and feet black; length 3 ft.; height 1 ft. 4 in.; tail about 1 ft.

The stronghold of the glutton is the great dividing fell range between Sweden and Norway, and principally in the very north. They do, however, occasionally wander down into the midland forests, far away from the fells, but the glutton is properly a true fell animal, and much dreaded by the Laps for the sake of the reindeer. The glutton pairs in January or February, and brings forth two to three young in April or May.

(*b*). Tuberculated teeth as in the last. Præmolars, $\frac{4}{3}$.

Gen. *Fortorius.*

Large; more than one foot in length; tail nearly as long as half the body, with no bushy tuft on the end; principally found in the neighbourhood of water.

21. F. PUTORIUS, L. Vanlig Iller. The Polecat. D. F.

Black-brown, with pale yellow bottom wool, under part black; lips, sides of nose, chin, and ears white; length 1ft. 4 l., tail 7 in.

Is confined to the south and the middle of the country. Pair here in February or March, and bring forth in May four to six young.

22. F. LUTREOLA, L. Flod Iller. F.

Brown, with dark bottom wool; ears, nose, and tail blackish; lips and chin white; toes webbed; length 1 ft.; tail 5 in.

Appears to take the place of the last in the very north, for it is never seen south of Finland. Habits more aquatic than the last; are said to pair in May, and bring forth in the middle of June. It is doubtful whether this species can be properly called Scandinavian, although very common in Finland.

Gen. *Mustela.*

Small, always under a foot in length; tail scarcely more than half the length of the head; becomes white in winter.

23. MUSTELA ERMINEA, L. Hermelin. The Stoat.

Tail at all seasons with a long black tip, ending in a bushy tuft; colour in summer red, brown above, below white, in winter pure white; length 9 in.; tail 5 in.; but they vary considerably in size, for I have seen them 12 in., with a tail measuring 7 in.

Is met with throughout all Scandinavia, and except in the extreme south is, I think, commoner than the last. It was very common on the fells, around Quickiock, in Lapland, but I never saw the weasel there.

24. Mus. vulgaris, Erxl. Små Vesla. The Weasel. D. F.

Tail with no black tip, always the same colour as the body; colour in summer red, brown in winter, pure white in the middle of the country, but in the south brown, at all times with a white belly; length 6 in. 4 l.; tail 1 in. 4 l., but I have seen this animal nearly 2 in. longer.

It has been doubted whether the weasel, like the stoat, becomes white in the winter. I can prove that this is the case from pure white specimens killed in Wermland in the winter. I can also prove by specimens kept in confinement that the change of colour from the red summer dress to the white of winter takes place by an actual change or shedding of the old coat, and not by the old hair changing colour. Not so common in Scandinavia as the last, but is said to go quite as far north.

(*c*). Upper tuberculated teeth, broader inwardly; præmolars, $\frac{3}{4}$.

Gen. *Martes*, Gesn.

Ears larger than in the last; tail bushy, longer than half the body; tongue rough; do not change colour in winter.

25. Martes foina, Briss. Sten Mård. The Stone, or Common Marten. D. F.

Body greyish brown, with black-brown bushy tail, and black legs; white throat and breast; soles of feet naked; throat spot at the bottom divided into two by a streak of the dark body colour, so that it appears doubly pointed; usual length 17 in.; tail to the point of the hair 12 in.

Is certainly not so common in Scandinavia as the next. We seldom kill one in the middle of Sweden, and it is said to go far up, but I believe the northern limits of neither, are as yet properly defined. I have never seen more than two specimens of this skin in the Carlstad market, although dozens of the other. Both species (for I cannot myself consider these two as identical) pair with us in

February, and bring forth two to three young in the end of April.

26. MARTES SYLVESTRIS, Gesn. Skogs Mård. The Pine Marten. D. F.

Body chestnut brown, with black-brown legs and bushy tail; the soles of the feet covered with hair; the throat and breast are yellow, and the breast spot terminates below in a single point.

I can prove by a young specimen killed in August, probably four months old, that the breast of the pine marten is yellow in the young as well as the old. Much commoner than the last, and is found in most of the old forests from Scania into Lapland.

(*d*). Upper tuberculated tooth broad; præmolars, $\frac{4}{4}$.

Gen. *Lutra.*

Head broad and flattened, with short blunt nose, small eyes and ears; legs short; toes webbed; tail long; horizontally flattened.

27. LUTRA VULGARIS, Erxl. Utter. The Otter. D. F.

Colour dark brown; sides of the head, throat, and chest, pale grey; tail longer than half the body; soles of feet naked. Length 2 ft. 8 in.; tail 1 ft. 4 in.

Common throughout all Scandinavia, for I have shot them in Scania as well as in Lulea Lapland. The breeding season here certainly takes place in February or early in March, and the female brings forth in May, from three to four blind young ones. As I have been told from very reliable authority, that the otter in England breeds in the winter, I have made very particular inquiries here of men who well know the habits of the otter, and all corroborate the above statement.

(*e*). Upper tuberculated tooth, three times as large as the canine teeth; præmolars, $\frac{4}{4}$.

Gen. *Meles,* Gesn.

Head long; nose pointed; small eyes and short legs; body flattened on the top; two anal openings.

28. Meles Taxus, Bodd. Gräfling. The Badger. D. F.

Body colour white-grey, mixed with black; under part and legs black; head white, with a broad black band through the eyes and ears on each side. Length 2 ft. 6 in., with a tail scarcely so long as the head.

Is common in the south and middle of the country, wherever there is a fitting locality; but does not go further north than Upland.

Like the bear, the dormouse, and the hedgehog, the badger lies up in its winter quarters till the spring.

B.—Tuberculated teeth, $\frac{2}{2}$.

1. Each tuberculated tooth above larger than the canine; præmolars widely divided.

Gen. *Ursus*, L.

Head broad; nose thick and blunt; forehead flat; eyes small; short pricky ears; body clumsy; tail short.

29. Ursus Arctos, L. Björn. The Bear. F.

Length about 6 ft.; height over the withers 3 ft.; ears longer than the tail; outer and inner toes of the same length; colour brown-black or grey.

The principal districts in which the bear is now found in Scandinavia are the thick forests from the north of Wermland to about 69° of north lat., or about the limit of the northern fir forests. They pair in August, and the female brings forth in her winter ide, or nest, from two to three young ones in February. Should the old female prove with young again the same year, she does not take her young ones into the ide with her that autumn, but finds them another somewhere close to her own ide. A good bear will weigh about 500 lb.

Remains of a fossil bear (*Ursus spelæus*), which are now dug up in the turf mosses of Scania, prove that in former ages a bear considerably larger than any land bear now extant inhabited the forests of South Scandinavia.

2. Each tuberculated tooth above less than the canine; præmolars in an unbroken row.

Gen. *Canis*, L.

Nose elongated, generally half the length of the head, with a deep depression on the forehead; ears in all the wild races stand erect; four toes on the hind and five on the fore feet, all armed with blunt claws not retractile.

Subgenus *Canis*.

Nose generally thicker and less pointed; pupil of the eye round; tail shorter than half the body.

30. CANIS LUPUS, L. Varg. (The Wolf.) F.

Body colour grey; nose, legs, ears, and sides of the body, yellowish; back black; tip of the tail black; ears pointed, yellow-brown outside; tail with long hair reaching down to the hocks. Length to the tip of the tail 4 ft.; height over the withers a little under 3 ft.

The black variety of the common wolf appears to have been rarely met with in Sweden. Considering the wild nature of the country, I think the wolf is very rare in Sweden, and especially in our midland districts. It appears to have a higher northern range than the bear. They principally spend the summer on the northern fells, but in winter come further south, and are then sometimes even seen in South Scania. Pair in February, and bring forth from five to six young in May.

31. C. FAMILIARIS, L. Hund. The Dog. D. F.

Tail always more or less turned upwards.

Is met with generally throughout Scandinavia of every orm and breed. The only forms of hound peculiar to the land which I know of, are the Dahlbo hound (now nearly extinct), a magnificent dog, rather like an English mastiff, of the size and colour of a wolf, which was formerly much used in these forests to watch the cattle when pasturing in the forests; the little bear hounds, not unlike the Esquimaux hounds, are peculiar to the north; and the Lap

hounds, used for tending the reindeer on the fells, are mangy, ugly little curs, unlike any breed I have ever seen before.

Subgenus *Vulpes*.

Nose pointed; pupil of the eye vertically oblong; tail longer than half the body.

32. C. VULPES, L. Skôgs Räf. The Common Fox. D. F.
Ears pointed; on the outside, as well as the legs, black; the soles of the feet bare; colour red; in the winter much darker and handsomer than in summer. Length 2 ft. 6 in.; tail nearly 2 ft.

I believe there is not the least difference between the Swedish and the British fox, except that I always thought the former was a little the largest. Is met with in all parts of Scandinavia, but not so common in Lapland as the next. We have two or three varieties in colour, of which the black fox is by far the rarest.

33. C. LAGOPUS, L. Fjäll Räf. (The Arctic Fox.) F.
Ears round, same colour as the body; soles of feet thickly covered with hair. Length 2 ft.; tail about a foot; winter dress pure white, and very bushy; in the beginning of July most of this long winter coat is shed, and till about October the colour is black-grey.

Is identical with the Arctic fox of other northern lands; met with on all the Scandinavian snow fells. Pair in April early, and the female brings forth from four to six young in June. The fur is worth very little, as the hair is said to come off.

ORDER 4.—PHOCACEA.

Fam. 1.—SEALS.

Not one of the Scandinavian seals has outward ears.

The female only brings forth one young in the year, which is at first covered with wool, and as long as it is thus covered, it never goes into the water.

GROUP 1.—Incisors, $\frac{6}{4}$.

A.—Molars with three or four points sitting in a row.

Gen. *Phoca*, L.

34. PHOCA VITULINA, Desm. Spräcklig Skäl. The Common Seal. D. F.

Molars oblique, so that the hinder margin of one is in contact with the front outer margin of the next behind it.

Body round, covered with small spots of black, white, or yellow grey, darker along the back; a pale ring round the eye. Length 5 to 6 ft.

Is the commonest of all the seals in the Sound, Cattegat, the west coast of Norway, and far up into Finland; rare in the Baltic.

35. P. ANNELLATA, Nilss. Ringlad Skäl. D. F.

Grinders arranged in the direction of the jaw, not obliquely as in the last.

Body elliptical, black above; back or sides covered with large oval rings; no ring round the eye; whiskers thin and brown. Length 3 to 4 ft.

Is the smallest of all the Scandinavian seals. Not at all uncommon off these coasts, but appears in different places according to season. Thus they are never seen off the Bohus coast, except in the winter, whereas they remain off the coast of Scania throughout the year. It is, however, most common in the Bothnia and North Baltic. This species may always be distinguished from the common seal (and I have seen both in the same pack off the southern coasts) by its much darker colour and the large oval white spots on the back and sides, about 2 in. long. It is singular that this species should be unknown in the British seas, since it has been taken in the Channel off the French coast.

36. P. GROENLANDICA, Müll. Grönlands Skäl. The Greenland Seal. F.

The grinders arranged in a straight series, with a small interval between them.

Whitish grey, covered with small and large black spots; whiskers wavy; the colour varies, becoming darker with age. Length 4 to 5 ft.

May certainly be said to belong to the Scandinavian fauna, as it has been taken off the north coast of Finland, but it has never been killed on any more southern coast.

37. P. BARBATA, Müll. Haf-ert Skäl. The Great Seal. F.

Teeth as in *vitulina*, but not placed obliquely. Whiskers large and numerous; front feet rounded, the side toes being the shortest; colour grey, unspotted. Length 8 to 10 ft.

The largest of all the northern true seals, and its peculiar home is the Polar Seas. It never by any chance appears to stray further south.

B.—Molars, simple, conical.

Gen. *Halichoerus*, Nilss.

38. HALICHOERUS GRYPHUS, Fab. Grä Skäl. The Grey Seal. D. F.

Jaw-bone arched.

Irregular black or blackish spots on a white grey, ash grey, steel grey, or black grey ground. Length 4 to 6 ft.

This species, when young, may easily be confounded with the young of the last, but among other distinguishing marks Nilsson mentions that the ear opening is placed at a distance from the eye equalling two-thirds of that from the eye to the tip of the nose. In *barbata* it is equal to not quite half that distance; and the whiskers are much thicker and the tail longer.

This is the common species in the Baltic and the Bothnia, from which latter gulf (where they winter and bring forth their young) they wander down into the Baltic about March. It is now that seal hunting is pursued on a larger scale than in perhaps any other of the European seas. Nilsson gives a good description of this seal-hunting:—

"In many places off these coasts the inhabitants in February and March fit out a small fleet of boats, with iron-shod keels, each provisioned for two or three months for eight men. These boats sail out to sea among the ice islands in search of the grey seal. Three or four boats generally follow each other in case of need in this adventurous chase. When they come to an iceberg, they fasten the boat on its lower side, and then try if they can find any seals on it.

"Such an island of drift ice is often three English miles long, and stands up 20 to 25 feet above the water's edge, and consists of larger and smaller masses of ice drifted together, forming a surface full of holes and cracks. On such an island the grey seal often assemble in large flocks. As soon as the hunters perceive them, they rush up, and with their clubs stun as many as they can before they can creep down into the sea through the holes in the ice. They let the young ones, which are now small, lie, as they will not take to the water by themselves. But if there are many holes in the ice the shooter must creep on his belly within shot and kill the seal with his gun. If it happens that a great many are assembled, and are fighting for places, which is usually the case, there is such a riot and confusion that they take little heed of the shot; and the shooter, who is dressed in seal skin, and moreover imitates beautifully the wriggling motions of the seal and their roaring cry, can often fire shot after shot, and secure a rich booty."

This must be a wild exciting chase, and one which I would give much to join in.

In the Greenland seas they appear to have a far less exciting but no less sure method of killing the seals, for the seal-hunter lies watching by the side of one of these breeding holes in the ice, with a harpoon on a line fastened to a stake stuck into the ice; and as soon as the seal sticks up his nose through the hole to breathe, the hunter pins him with the harpoon, and after playing him, like an enormous pike, till he is exhausted, draws him up on to the ice.

The seal harvest is often a rich one to the poor fishermen in the north of the Baltic, where many thousands are killed every year; for a grey seal of 400 lb. weight has generally 240 lb. of blubber, which, after the rate of 8 rqr. bco. per 20 lb., gives a return of 36 rqr. bco., and the skin, which is worth 3 to 5 rqr. more, is so that a good seal will probably be worth 40 rqr.

In the summer they have in many places in the Baltic a method of taking the seals in very strong coarse nets.

I have had a little seal shooting myself in the Bohus Land coast. I recollect that if ever a seal floated after it was shot it was always very fat, and generally a female. The males were always thinnest, and sank when shot.

GROUP 2.—Incisors, $\frac{4}{4}$.

Molars small, divided, edged at the points.

Gen. *Cystophora*, Nilss.

Head large, forehead broad and covered in the adult male, with a tuberculated skin, like an inflated bladder.

39. CYSTOPHORA CRISTATA, Erxl. Bläs Skäl. (The Cowl Seal). F.

Length, 5 to 12 ft.

The peculiar home of this curious-looking seal is the Polar ocean, from which occasionally a young specimen wanders down to the north coast of Norway and Finland.

Tip of the nose covered with hair, blackish; body steel grey; in the young unspotted, in the older spotted black; in the adult variegated with white, grey, and black.

Fam. 2.—WALRUS.

Two long projecting tusks from the upper jaw, in which are 2 to 4 incisors, but none in the under jaw.

Gen. *Trichechus*.

Body covered with coarse brown-yellow, brown, or grey hair; tusks 2 feet long.

40. TRICHECHUS ROSMARUS, L. Hvalross. The Walrus. F.

Length, 12 to 14 ft.

As it is very rarely that this animal leaves the fields of drift ice, which form its peculiar home, it is only accidentally that a specimen, generally a young one, is seen on any Scandinavian coast.

ORDER 5.—RODENTIA.

The distinguishing marks of this order are the two large chisel-shaped incisors in the front of each jaw, distinct from the molars.

Group 1.—Collar Bone Perfect.

Fam. 1.—Murina.

Molars $\frac{3 \text{ or } 4}{3}$, tuberculated with divided roots, or composite without tubercles, and with open undivided roots. Tail round, naked, always as long as the body, often much longer. Hind toes 5; front toes 4, with a knob instead of thumb.

Gen. *Sminthus*, Keys. and Blas.

Upper lip not cloven, covered with hair; ears stand well out of the fur, and are covered with hair.

41. Sminthus Betulinus, Pall. Lang Svansad Buskmus. F.

Colour, yellow or rusty grey, with a small black streak along the back; below, white-grey. Tail much longer than the whole body. Ears one-third the length of the head. Length of head and body, 2¼ in.; tail 3¼ in. Tail so thickly covered with hair, that the rings could not be reckoned.

Such is a description of this species, the only one of the genus yet known, whose proper home is Siberia, and which has, strange to say, been added to the Scandinavian fauna from one single specimen killed in Scania in 1835.

Gen. *Mus*, L.

Tail long, rings always apparent. Upper lip cloven up to the nose. Ears long, standing well out of the fur, and nearly bare.

Rats.

Body and tail together a foot long. Rings in the tail 210 to 260.

42. Mus Rattus, L. Svart Ratta. The Black Rat. D. F.

Blackish above, ash grey beneath. Tail longer than body. Ears large, half the length of the head. Length 6½ in.; tail 8 in.

Becomes every year more scarce in Scandinavia wherever the large brown rat gains a footing. Was once common throughout the whole country.

43. Mus decumanus, Pall. Brun Ratta. The Brown Rat. D. F.

Yellow-brown, with a few stiff black hairs sprinkled among the others. Grey-white beneath, the colours sharply divided. Tail shorter than body. Ears one-third of the head length. Length, 9 in.; tail, 7 in.

In the days of Linné, the brown rat was unknown in Sweden; about ninety years since the first was seen in Scania. It has now, however, become gradually spread over the land, and is met with in every part to the North Cape. Although at deadly enmity with its smaller brother, it does not interfere with the little mouse. Strange to say, much as this country is overrun with rats, I never saw either a ferret or a rat-trap till I got some over from England. I know no country where a good rat-catcher could make a better living than in this. I once saw the rats drummed out of a house here which was full of them. It was a large wooden building. Two regimental drummers were sent for, who began at the very top of the house, and drummed in every room. The rats bolted very fast, and I had some capital shooting outside. It was long before any came back.

Mice.

Tail and body together not longer than 9 in.; rings in the tail, 120 to 180.

44. Mus Sylvaticus, L. Skögs Mus. The Long-tailed Field Mouse. D. F.

A sharp division between the yellow-grey or rusty brown upper, and white under part; ears the length of half the head; tail a little shorter than the body. Length 4 in.; tail 3½ in.; colour duller in winter.

Is spread over the whole country, except Lapland.

45. Mus musculus, L. Hus Mus. The Common Mouse. D. F.

Colour above dull grey, by degrees joining the pale grey or dirty white under parts of the body; ears half as long as head. Length 3 in.; tail 3 in.

Is spread almost all over Scandinavia, where the dwellings of man are found, although I never could hear of it in Lapland. It is, however, found both in Iceland and Siberia, although not in Kamtschatka. I have a doubt, however, whether the Iceland mouse is identical with our common *mus musculus*.

The *mus agrarius*, Pall., which much resembles *mus sylvaticus*, has been observed in Denmark, never in Scandinavia; and the little harvest mouse, *mus minutus*, Pall., which has been taken both in Denmark and Finland, has been probably overlooked in Sweden and Norway.

Gen. *Lemmus*, Geoff.

Tail covered with short hair, never so long as half the body; ears hidden; molars composite, without tubercles even on the top; all the streaks on the molars zig-zag.

46. Lemmus Amphibius, L. Storre Jord Ratta. The Water Vole. D. F.

Tail about half the length of the body and unicolorous; ears hidden; colour black or brown above, under brown grey; lips white. Length 6 in. 4 l.; tail 4 in. 2 l. Varies very much in colour.

Is met with in many parts of this continent, from the very south up to within the polar circle. I obtained a very

large specimen at Iockmock, in Lulea Lapland, where no one had ever seen it before.

47. L. MEDIUS, Nilss. Mindre Jord Ratta. F.

Tail, which is longer than one-third of the body, is dark brown above, whitish below; ears hidden in the fur; colour above, dark brown, below pale grey; lips white. Length 5 in.; tail 2 in.; but I have found them vary very much in colour as well as in size, but always blue-grey underneath.

Is never met with south of Gulbrandsdaten, Norway. At Quickiock I found it the commonest field mouse in all the fell meadows and valleys, never on the fells themselves. In shape it rather resembles the last, but is much more slender. I cannot see this species mentioned by Clermont, and suppose it has been confounded with the *arvicola terrestris*, De Selys, which it appears much to resemble.

48. L. GLAREOLUS, Schreb. Langsvänsad mark Mus. The Bank Vole. D. F.

The tail (half as long again as the head, thin, of an equal thickness throughout) is brown above, white beneath; ears broad, standing out of the fur, which is red-brown above, white below, with a sharp division of colour; feet white. Length 3 in. 6 l.; tail 1 in. 6 l.

Common throughout all Scandinavia to far within the polar circle. We met with it commonly at Quickiock.

49. L. RUFOCANUS, Sund. Grå sidig mark Mus. F.

Tail scarcely longer than the head, tapering, ending in a hare tip; ears very little apparent; back and crown of the head red-brown; on the sides ash grey; the division of colours very distinct; belly light grey; the hinder molar above has three lateral edges on the inner margin. Length 3 ft. 5 in.; tail 1 in. 1 l.

I found this little mouse at Quickiock, but it was rare. It may easily be confounded with the last, and even with the short-tailed field mouse, by a casual observer, for the shape

and size is much the same, although this is the smallest, and the colour is different. But really, when studying these little field mice, a man gets so confused by the different shades of colour and size even in individuals of the same genus that he is very likely to confound one with another. Is confined to Lapland.

50. L. RUTILUS, Pall. Rödbrun Mark Mus. F.

Tail rather longer than the head, of an even thickness throughout, covered with long hair. Ears very apparent. Colour, red-brown above; on the sides blending into yellow-grey; under parts dirty white; feet grey. Length 3¼ in.; tail 1⅛ in. The innermost molar has four lateral ridges inside.

Is very like the last, but the ears are about 3½ lines higher, and standing nearly half out of the fur. Confined to Lapland and Finland; appears to be rarer than the last, and I never met with it at Quickiock.

Gen. *Arvicola.*

The middle molars have three lateral edges on the outer margin above, and three on the inner, of which two are like those on the outer, the third smaller.

51. ARVICOLA AGRESTIS, Sund. Grå brun mark Mus. The Short-tailed Field Mouse. D. F.

Tail about the length of the head, small, and tapering; ears scarcely appearing above the bushy fur, which is dark grey-brown above; belly, as well as the feet, pale ash grey. Length 4 in.; tail 1⅛ in.

Is subject to much variation in colour and size. The female always largest, and with a longer tail. Is met with all over Scandinavia, at least as far up as Quickiock, Lapland.

Gen. *Lemmus.*

The streaks of the back molars run nearly parallel, in the others zig-zag; molars behind as broad as in front; tail very short, about equal to the length of half the head; ears small, entirely hidden in the fur.

52. LEMMUS NORVEGICUS, Worm. Fjäll Lemmel. (The Lemming.) F.

Colour rusty yellow and black; variegated head; neck, and front of the back, black, with a small rusty yellow long streak before each ear; the under parts of the body pale yellow. Tail shorter than the hind foot without the claw; the claws of the fore foot larger than those of the hind feet. Length 5 in.; tail, with the hair, 6 l.

Confined to the great northern fell ridge, from which they make extraordinary migrations at irregular periods. Have been known to come as far south as Carlstad, in Wermland.

53. L. SCHISTICOLOR, Lillj. Skögs Lemmel.

Body colour, above dark grey, with a rusty patch on the loins; below paler grey. Tail equal in length to the hind foot without the claw: above dark brown, beneath whitish. The claws of the hinder feet larger than those of the front feet. Length about 3 to 4 in.; tail 4½ l.

Discovered by Lilljeborg in 1843, in Lille Hammar, Gulbrandsdaten, Norway, where they were common, and known by the name of *Svart grå Mus*. They were found in a fir forest.

Fam. 2.—SCIURINA.

Molars $\frac{4 \text{ or } 5}{4}$, all with divided roots. Tail covered with long hair, directed towards each side. Feet as in the last.

Gen. *Myoxus*, Schreb.

Tail as long as the body, with long hair directed laterally; ears apparent; eyes large; body thick and plump.

54. MYOXUS GLIS, Desm. Hassel Mus. The Dormouse. D.

Colour, brown-red or brown-yellow above; under pale red-yellow; throat and breast white. Length 3 in.; tail the same.

Is confined to the south of Sweden, and is rare even there.

Gen. *Pteromys*, Geoff.

Form like the squirrel, but the tail is shorter; the ears scarcely apparent; and the skin between the front and hind legs forms a kind of web, which the animal can expand as it floats through the air. Must not, however, be confounded with the flying squirrels of Australia, which belong to the genus *petaurus*, and have a totally different form of dentition.

55. PTEROMYS VOLANS, Desm. Flygande Ekorre. The Flying Squirrel. F.

Length 6 in. 6 l.; tail, without the hair, 4 in. 2 l. Colour, above pale shining grey; under white.

Can hardly be included in the Scandinavian fauna, although, according to Linné, it was in his time met with in Swedish and Norwegian Lapland. Not a specimen, however, appears to have been killed in either country since then.

Sciurus.

Tail longer than the body; ears standing far out of the fur; skin on the sides sits closely to the body.

56. SCIURUS VULGARIS, L. Allman Ekorre. The Squirrel. D. F.

Ears with a long-pointed hair tip. Body above and tail of the same colour in summer; red-brown in winter; more or less grey according to the latitude in which they are met with. Length about 8 in.; tail 9 in.

Common in all the Scandinavian forests, from the extreme south to far within the polar circle.

Fam. 3.—PALMIPEDIA.

Molars $\frac{4}{4}$, compound with flat summits. The three middle toes on the hind foot joined by a web. Tail horizontally flattened, bare.

Gen. *Castor*, L.

Tail flat, broad, scaly; ears very short; five toes on

each foot, all the hinder ones united by a web; the second toe on the hind foot furnished with a double claw.

57. CASTOR FIBER, L. Bäfver. The Beaver. F.

Colour brown, with grey bottom wool; body behind by degrees merging into the tail, which at the root is thick and covered with hair, outwardly oval; feet oblong and naked both above and below, scaly, about as long as half the body. Length 2 ft. 6 in.; tail 14 in.

Is quite exterminated now from all the Scandinavian forests, except in the extreme north of Lapland and Finland. Formerly they were to be met with in many parts of Scandinavia, and it is said even in the extreme south.

GROUP 2.—Collar Bone Absent.

Fam. 4.—LEPORINA.

Molars $\frac{6}{6}$, with flat summits, the plates of enamel transverse. Incisors white, grooved. Ears very long. Tail short, turned up.

Gen. *Lepus*, L.

Ears as long as the head; tail short, turned up; feet underneath thickly covered with hair; head round; upper lip divided.

The European hare (*L. Timidus*), which is met with both in Denmark and East Finland, is not found in Scandinavia.

58. LEPUS CANESCENS, Nilss. Mo hare, Syd hare. D.

Ears on the whole tip for about 6 lines broad, and along a great portion of the hinder edge black; wool at the bottom ash blue; colour in summer above and on the sides yellowish grey-brown; in winter blue-grey; tail very short, bushy, at all seasons white; ears when laid back in general reach only to, or a very little beyond, the tip of the nose. Length about 2 ft. to the root of the tail; tail without the hair nearly 2 in.

This species or variety is most common in the South

(and is even found on the Isle of Huen, in the Sound). It is hardly yet determined how far north it goes. I have killed them in South Wermland, and they are said to be sometimes killed near Stockholm, but certainly never so far up as Norrland.

59. L. Borealis, Nilss. Fjäll Hare, Nord Hare. The Alpine Hare. F.

Ears only on the tips for about 3 lines, broad black; fur in the bottom white or whitish; colour in summer above and on the sides grey, in the winter pure white; ears when laid back reach nearly an inch in front of the tip of the nose. Rather smaller than the last. Length about 1 ft. 10 in; tail without hair 2½ in.

Is very rarely met with further south than Wermland, but is common from thence far up into Lapland, where it frequents both the forests and the bare fells.

That this is identical with the Alpine hare of the north of Britain, and a distinct species from the common European hare (*L. Timidus*) is I believe allowed by all; and also that the Irish hare (*L. Hibernicus*, Yarr.) is nothing more than a variety in colour of this, is also most probable. But I am almost inclined to agree with Blasius, who says that both the Swedish hares and the Irish hare are nothing more than forms, or varieties in colour of one species, *L. variabilis*, Pall:—

(1). *L. hibernicus*, Yarr.; *L. canescens*, Nilss. A form met with in the warmer climes—in Ireland and the south of Sweden; colour both in summer and winter grey-brown.

(2). *L. variabilis*, Pall.; *L. Alpinus*, Penn.; *L. borealis*, Nilss. Summer grey-brown, in winter white with black ear tips. Found on the Pyrenees, the Alps, in Scotland, Scandinavia, Finland, North Russia, and Siberia.

(3). *L. glacialis*, Leach. In both summer and winter white with black ear tips. Found in the high north of Europe, Asia, and Greenland.

60. L. CUNICULUS, L. Kanin. The Rabbit. D. F.

Ears shorter than the head, of one colour without the black tip; colour grey, mixed with yellow-brown; neck red-brown; tail shorter than the thigh-bone; brown above. Length 1 ft. 5 in.; tail 3 in.

Is not met with in a wild state either in Scandinavia, Denmark, or Finland, although tame rabbits are kept in many parts, at least as far up as Stockholm.

II.—*Quadrupeds furnished with hoofs.*

ORDER 6.—PACHYDERMATA.

Hoofed animals which do not ruminate. Incisors in both jaws, $\frac{6}{6}$.

Gen. *Sus*, L.

Molars tuberculated; 4 toes on each foot; nose ends in a snout; body covered with bristles.

61. SUS SCROFA DOMESTICUS, Erxl. Tamt Svin. The Domestic Pig. D. F.

Body and tusks more slender than in the wild pig; ears longer and often hanging down; colour white, black, red, or spotted.

Is met with throughout all Scandinavia, except in the far north, where the price of corn is so dear that "pigs won't pay for feeding."

Sus Scrofa-ferus. Vild Svin. (The Wild Boar).

Ears shorter, rounded, standing erect; tusks larger; nose and snout thicker and more lengthened; colour black or dull blackish grey; legs and ears black.

Although now extinct in Scandinavia, fossil remains which are occasionally dug up in the turf mosses of the south, prove that in by-gone ages wild pigs of a very large size inhabited this continent.

Gen. *Equus*, L.

Head oblong; nose covered with hair; ears moderate; body covered with fine hair: tail and neck with longer, thicker hair; teats two; toes encircled with a single hoof.

62. EQUUS CABALLUS, L. Häst. The Horse. D. F.

Is met with throughout all Scandinavia, and far up into Lapland.

Horse flesh is often eaten here salted, but I never could hear of anyone who much relished it. There is something unnatural to my taste in using this food.

63. EQUUS ASINUS, L. Asna. The Ass. D.

Ears long; tail only on the tip covered with long hair; colour grey-black, with a black streak along the back, and a cross streak over the loins.

Is very rare in Sweden, and I don't think that I ever saw one, although they would doubtless thrive in the middle and south of the country.

ORDER 7.—RUMINANTIA.

Quadrupeds that ruminate or chew the cud. No incisors in the upper jaw, 8 broad incisors in the under. Two front toes on each foot; encircled with hoofs.

Fam. 1.—CERVINA.

Horns solid, branchy. Shed annually.

Cervus, L.

Horns peculiar to the males, except in the reindeer; lachrymal sinus under each eye; body rounded; legs high and slender; tail short; teats 4. In some species canine teeth are present, but only in the upper jaw.

With smooth more or less palmated horns.

64. CERVUS ALCES, L. Elg. The Elk. F.

Nose broad, covered with hair, except just a little bare spot between the nostrils; under the throat a

tuft of long hair like a beard, and in the male a protuberance on the throat; a tuft of stiff hair inside the hock; ears much longer than the tail. Length 7 to 8 ft.; height 6 ft.; colour in winter, grey-brown, in summer brown. Young, pale brown. Female much smaller than the male, without horns.

The horns are shed in the end of January, and in August they are full-grown again. They are at first single and cylindrical; in the second year they are about 1 ft. long, but undivided; in the third year they have 2 points; in the fourth 3, when they begin to flatten out; in the fifth they are full-grown as to breadth, but after that they yearly become broader, and have more points, even up to 18 or 20.

About a century ago the elk was shot in Blekinge, and even Halland, in the very south. Now, however, the limit of this animal in Scandinavia may be reckoned from 58° north lat. to 64°.

The rutting season is in the end of September, and the calf (or two calves) is born about the middle of June.

Live principally on branches of the willow, aspen, birch, mountain ash, and bleaberry fibres.

65. C. TARANDUS, L. Ren. (The Reindeer). F.

Tip of the nose altogether covered with hair; hoofs broad and blunt, a small tuft of hair on the inside of the hock, and a smaller one outside; horns smooth, round, long, branchy, directed backwards and then curved forwards, very much developed. Both the males and females have horns. A male of the wild reindeer will measure about as follows—Length 6 ft. 4 in., of which the head is 1 ft. 8 in.; neck 1 ft. 1 in. height over the withers 3 ft. 9 in.; over the loins 3 ft. 10 in.

The wild reindeer are always larger than the tame, and of the tame deer they have two sizes, the Skags Renarne (or forest reindeer) and the Fjäll Renarne (or fell rein). Of these the forest reindeer are always largest. A tame reindeer will never weigh above 200 lb. and wild reindeer often 360 lb. when full grown.

The southern limit of the wild reindeer in Sweden is 62° north. The tame reindeer is common all over the flat fells and forests (the latter during the winter) up to the North Cape.

The rutting season is about the beginning of October, and the pairing takes place when they assemble in large flocks on the snow fells. It lasts some time, and eight days after it is over, in the end of October or November, the old male reindeer shed their horns. The rein cow brings forth one calf in May, or the beginning of June, on the bare ground on the snow fells. When this is about eight or ten days old, and does not require the care of the mother to defend it against the rein oxen, the old mother sheds her horns; and at about the same time the young rein bulls shed theirs.

The young male can pair during the first autumn, or about five months after its birth.

66. C. Dama, L. Dof hjort. The Fallow Deer. D.

Nose and upper lip naked.; tail half as long as the thigh; horns of the male palmate; the beam round, with two antlers standing forward. Length about 4 feet; height about 3 feet. Colour in summer, red-brown, with small white spots on the back, shoulders, and loins. In winter, grey without spots.

Has never been wild in Scandinavia, and it is only in very few parks that we see them tame at the present day.

Horns round from the end to the tip, with numerous antlers.

67. C. Elaphus, L. Hjort. The Red Deer.

Tip of the nose bare; tail short. Colour in summer, red-brown; in winter, reddish grey. Length 6 to 7 ft.; height 4 ft., or a little over; tail, 6 in.

The horns are full at the eighth year, up to which time every antler will mark a year in the growth.

Is never met with wild in any part of Sweden, but is, I believe, still to be found sparingly on some of the islands of the Norwegian coast.

68. C. Capreola, L. Rädjur. The Roe Deer. D.

Nose bare; tail almost obsolete. The horns rise perpendicularly from the head, very rough and furrowed, with two antlers. Colour in summer, yellow-brown; in winter, grey-brown, with white round the tail. Length about 4 ft.; height $2\frac{1}{4}$ ft.

Is still to be met with in Scania, Halland, and Blekinge, but in no other Swedish province.

Fam. 2.—Horns permanent for Life.

1.—*Caprina.* Horns angular, hollow, and rough.

Gen. *Capra,* L.

No lachrymal sinus. A beard on the chin.

69. Capra Hircus, L. Get. The Goat. D. F.

Beard long; body covered with long coarse hair. Colour, white, black, brown, grey, or spotted.

Is to be met with tame in many parts, but no where wild.

Gen. *Ovis,* L.

No beard. Body covered with fine wool.

70. Ovis Aries, L. Får. The Sheep. D. F.

Is met with tame as far up at least as Quickiock, Lapland.

2.—*Bovina.* Horns round, smooth.

Gen. *Bos,* L.

Head oblong, with broad bare nose; horns round, pointed; the bottom furnished with rings, each one of which determines a year in the animal's growth. Tail long.

71. Bos Taurus, L. Tama Ox. The Ox. D. F.

Colour, size, length of horns, etc., much alike in different races.

The breeds indigenous to Sweden are small.

Met with throughout all Scandinavia, far up into Lapland. Of the wild oxen which inhabited Scandinavia in the

olden time, and skulls and bones of which are at the present day met with in the turf mosses of the South, we may notice the—

Bos Urus, Antiq. Ur Oxen. The Wild Ox.
Bos Frontosus, N. Sp. Hög Nackad Oxe.
Bos Longifrons, Owen. Dverg Oxe.
Bos Bison, L. Bison Oxe. (Aurochs.)

III.—*Body furnished with Fins.*

ORDER 8.—CETACEA. WHALES.

Body, fish formed; skin smooth, naked; tail fin horizontal, deeply cloven; hinder extremities altogether wanting; the front extremities consist of fins.

1. Whales with teeth.—Spout hole, single, crescent shaped, placed on the top of the head; both jaws furnished with numerous simple teeth. Form of the body smaller than in the following.

2. With Whale Bone.—Spout holes in the form of two longitudinal furrows, lie nearer the point of the nose than in the last; no teeth; but in their place the palate is furnished with transverse plates of baleen, or whalebone; no dorsal fin.

NOTE.—It is probable that some of the species mentioned below may occasionally appear in the White Sea, off the north coast of Finland, but none are seen on the Finnish coasts of the Bothnia, except those that are marked F.

Fam. 1.—Whales with teeth.

Gen. *Delphinus*, L.

Body tolerably large; 6 to 8 feet long, and well proportioned; head conically pointed, with a depression over the nose; teeth numerous, pointed; the row of teeth in the under jaw longer than half the jaw.

72. DELPHINUS DELPHIS, L. Gomfårad Delfin. The Common Dolphin.

Nose small and long; longer than any other dolphin; teeth 43 to 50 on each side of the upper and lower jaws; skin smooth, glossy. Colour, above grey-black; below white. Length 6 to 8 ft.; dorsal fin, 9 to 10 in. high; pectorals rather longer; tail 12 in. broad.

Rare in these seas.

I may here remark that the fish to which sailors commonly give the name of the dolphin is not this, but a true fish, the *Coryphæna Hippuris*, L., celebrated for its swiftness in swimming, and its brilliant and beautiful colours.

73. D. EUPHROSYNE, Gray, Fin Tandad Delfin.

Gums without a furrow; teeth in a bent row, 42 to 46 in each jaw, very small, pointed, crooked; 6 to an inch along the nose, the length of which is equal to three times its breadth; a half round rib, with vertical sides. Length of the skull 16 in. 4 l.; nose 10 in. 4 l.

Skulls of this and the next species are deposited in the Lund Museum, supposed to have been taken in the Cattegat. Rather a loose authority for giving either of these species a place in the Scandinavian fauna.

74. D. OBSCURUS, Gray. Delfin med räta Tandrader.

Teeth in a straight row; 30 to 32 in each jaw; 4½ to an inch; length of the skull 15 in.; nose 8 in. 6 l.

75. D. LEUCOPLEURUS, Rasch. Hvitsidig Delfin. (The White-sided Bottle-nosed Dolphin.)

Teeth thirty on each jaw, four to the inch; nose double as long as it is broad; length 6 ft. 1 in.; nose 8 in. 6 l.; colour above blue-black; below white, with a large oblique grey longitudinal streak on the hinder part of each side.

Is rarely met with in the Cattegat; more frequently on the Norwegian coast, in large flocks.

76. D. IBSENII. Eschli. Gröf Tandad Delfin. (The White-beaked Bottle-nose.) D.

Teeth 26 to 27 in each jaw, large, conical, 3 to an inch;

length of the nose equal to 1½ of its breadth; whole length about 9 Swedish feet, number of vertebræ 94 (the greatest number in any dolphin, and 12 more than in the last).

Nilsson's description appears to be taken from a skeleton, and he adds, "if this is the same species as Gray's *D. albirostus* (which he fancies it is), the colour above is pure black; below white, dorsal fin high. Has been taken in the very south of the Sound.

Gen. *Tursio.*

Subgenus *Tursio.*

Body clumsy; head blunt; teeth few and conical; from 7 to 24 in a jaw; the tooth row in the under jaw shorter than half the jaw.

77. Delphinus Tursio, Fab. Öre svin. The Bottle-nosed Dolphin. D.

Teeth 22 to 24 on each side of jaw, straight, conical, the thickness of a swan's quill, 2 to an inch; length 10 to 12 ft.; nose tolerably pointed, dorsal fin 10 in. high, crescent-shaped behind; colour above black, which by degrees merges in the white underparts, sometimes altogether black.

Is principally confined to the North Sea, where it goes up as far as Greenland, and sometimes seeks the coasts of Norway, Sweden, and Denmark.

78. D. Orca, Fab. Späck Huggare. The Grampus. D.

Snout very short and obtuse; dorsal fin very high; nose much more sloping, and the whole animal much larger than the porpoise; teeth 11 to 12 on each jaw, thick, blunt, crooked; colour glossy black above, below pure white, a white spot above each eye.

The largest recorded on these coasts was a specimen noticed by Gunnerus, which was taken off the coast of Nor-

way, near Heligoland, in 1762, which was 24 ft. long, 9 ft. thick, and had a dorsal fin 6 ft. high. Is principally confined to the North Sea, from whence specimens occasionally wander down as far as the south of the Sound.

79. D. Globiceps, Cuv. (*Melas*, Trail.) Grind Delfin. The Round-headed Porpoise Caing Whale.

Head short and round, with the forehead very convex and prominent; teeth conical; usual length 20 ft. pectorals very long and pointed; colour black, under the throat a white spot which stretches back like a small streak on the under parts.

Has never been seen in the Cattegat or Baltic; only met with in the North Sea, off the coast of Norway.

80. D. Leucas, Pall. Hvit Delfin. The White Beluga.

No dorsal fin; colour white, sometimes tinged with rosy yellow; head blunt and broad; snout not produced; teeth $\frac{1}{7}^{0}$, blunt; length 12 to 14 ft.

The Greenland, Spitzbergen, and Iceland seas are the proper home of the beluga, which is rarely seen off any Scandinavian coast.

Sub-genus. *Phocæna.*

Body small; head blunt, pointed; no depression in front of nose; teeth small, blunt, rounded, compressed.

81. D. Phocæna, L. Vanlig Tumlare. The Porpoise. D. F.

A small dorsal fin; head obtuse, not beaked; teeth 30 to 24 on each side, above and below, differing in form from those of any other *cetacean*; instead of being conical they are compressed and rounded at the apex; colour, upper parts blackish, gradually becoming lighter on the sides; belly pure white; pectorals brown; usual length 4 to 8 ft.

The commonest of all the *cetaceæ* on these coasts, from the Baltic right up into the Polar Sea.

Gen. *Monodon*, L.

Teeth two, one generally remaining undeveloped in the jaw, the other stretching forward in a line with the body, straight, long, and spirally twisted; no dorsal fin.

82. MONODON MONOCEROS, L. Vanlig Norhval. The Narwhal.

Length 13 to 16 ft.; tusk often 9 ft.; colour yellowish white, covered all over with round greyish spots.

Only met with off the northern coasts of Scandinavia.

Two small pointed teeth in the very front of the under jaw; nose forms a pointed kind of beak.

Gen. *Hyperoodon*, L.

A dorsal fin, snout produced, forehead much elevated.

83. HYPEROODON BOREALIS, Nilss. Näbbhval. The Bottle Head. D.

Head like that of a dolphin, but the snout is not so long, and the jaws are without teeth; length 20 to 25 ft.; head black above, white underneath.

Is principally confined to the very northern seas, but specimens have been taken in the Cattegat, Sound, and even in the Little Belt.

Fam. 2.—Whales with whalebone.

1. With dorsal fin; longitudinal folds on the throat and belly; plates of whalebone, short and thin.

(*a*). Pectorals short.

Gen. *Balœna*.

Body large, fins as in the dolphin; blow-holes formed by two longitudinal furrows.

84. BALÆNA ROSTRATA, Fab. Vik-hvalen.

The smallest of all the whales, and is oftener taken in

bays and shallow water than the others; length never over 32 ft.

Body small, pectorals short; dorsal on the posterior third of the back; colour black above, white beneath, pectorals white above. Is met with occasionally off the west coast of Norway, principally in summer.

Deep Sea Whales.

85. B. PHYSALUS, Fab. Sill-hvalen.

I cannot identify this whale or the last with any described by Clermont. Whalebone black; breast fins blackish; dorsal fins inserted behind; number of vertebræ 54 to 56; ribs 14 to 15 pair; body nearly round; pectorals lanceolate, equal in length to one-seventh of the body; colour black above, white below; length 65 to 70 feet.

Comes on to the west coast of Norway after the herrings.

(*b*). Pectorals long.

86. B. BOOPS, Fab. Rör-hvalen. The Northern Rorqual.

Pectorals oblong, tapering, equal to one-fourth of the whole body length; whalebone black; dorsal very small; vertebræ 54; ribs 15; length 60 to 70 ft.; colour black above, under part white spotted or marbled with black; pectorals blood red.

The North Atlantic is the principal home of this whale.

2. No dorsal fin; body smooth underneath; whalebone thick, long.

87. BALÆNA MYSTICETUS, L. Grönlands Hvalen. The Common Whale.

Body more conical, head much broader and blunter than the last; whalebone black, and very long; length 60 to 67 ft.; diameter 13 ft.; circumference 40 ft.

Nilsson remarks that the weight of such an animal being 100 tons or 2200 ctnr., or 220,000 lb., is equal to 88 elephants, or 440 bears. The whalebone in such a whale may be taken at 3360 lb., and the blubber at 140 to 170

tuns. Was formerly seen off the Scandinavian coast, but never now, so that it can scarcely any longer be said to belong to its fauna.

B. prisca. Fossil Fen hvalen.

The fossil remains of this whale which have been found on the coast off Ystad, in the Baltic, and even far inland in Wängapanse, Westergothland, betoken a whale which, although not more than between 50 and 60 ft. long, must at least have had a body 27 times larger and heavier than the common whale.

CLASS II.—AVES.

LIST OF ALL THE BIRDS MET WITH AT THE PRESENT DAY IN SCANDINAVIA, DENMARK, FINLAND, GREENLAND, AND SPITZBERGEN.

NOTE.—The limit for the Finland fauna is this: from the bottom of the Gulf of Finland, through Ladoga, Omega, and the White Sea, to Waranger Fjörd, near the North Cape, from thence following the Tana River (which is the political division between Sweden and Norway) south, down the Gulfs of Bothnia and Finland to the starting point.

DIVISION 1.—HETEROPHAGA.

The young of which cannot feed themselves.

ORDER 1.—RAPTORES.

Birds of prey may be always distinguished by the sharp hooked beak, and the sharp, long, pointed, crooked claws.

DIURNAL BIRDS OF PREY.

Eyes placed on the sides of the head, small.

None of the vultures have as yet been observed in Scandinavia; but two species, the *Vultur Fulvus*, L., and *Vultur Cinereus*, L., have been added to the Danish fauna.

Fam. 1.—FALCONIDÆ.

Head feathered, nostrils lateral, placed in a naked cell at the root of the beak; outer and middle toes joined at the root.

Gen. *Falco*, L. Falcons.

Beak short and thick, furnished with a pointed tooth

on the edge of the upper mandibles, just behind the tip. Wings long and pointed, second feather longest. Tail scarcely longer than the closed wings.

1. FALCO GYRFALCO, L. F. Gyrfalco Norvegicus, Wolley. Blä Falk, Norv. Jagt Falk, Sw. Rip. Spenning, Lap. Jahti Havkka, Fin. The Norwegian Jer Falcon.

By the Swedish naturalists, *F. Gyrfalco*, L., *F. Islandicus*, and *F. Greenlandicus*, Hamck, are considered one and the same species, in different states of plumage. I must confess, however, that I agree with Mr. Wolley, and consider this Norwegian Jer falcon, a distinct and good species, whose peculiar breeding home, is on the great Scandinavian fell range.

I have not space here to enter into details to prove on what grounds my opinion is formed, further than briefly to observe that although, in all the specimens which I have seen of this Norwegian Jer falcon, there certainly was a great resemblance between the two birds, the plumage has quite a different character to that of the Iceland or Greenland falcon at any age. The back is of a deeper, more uniform, and uninterrupted blue colour, and you see little or no difference in the shadings of the different specimens, as you do when looking over a series of the Iceland falcon skins. They may probably become lighter by age, but that is only on account of the blue colour fading, they never become white like the Iceland or Greenland birds, and the greatest resemblance between the two species is in the middle-aged birds. Wright observes that this middle-aged dress of the Norwegian bird, as described by Naumann, agrees with the figure in the "Swedish Sporting Magazine" of a Norwegian Jer falcon shot at Karuscando (Lapland), 1833; and the coloured figure, which is said in the description to represent the bird in its *usual dress*, is as dark and very similar to Dr. Bree's coloured engraving of the Norwegian falcon in his "Birds of Europe not Observed in the British Isles." This is much darker than

the usual colour of even the *young* Iceland falcon; moreover I always fancy that there is a considerable difference in the size of the birds.

In the winter they occasionally wander down from the fells, for I have seen a specimen which was shot in Wermland, apparently in its second year, and there was a marked difference between this and a young Iceland falcon with which I compared it. This falcon, in fact, more resembles the peregrine, although I certainly never saw the plumage so dark as in this latter bird. It has moreover, no white on the nape of the neck, and the moustache is not nearly so perceptible.

The egg resembles that of the Iceland falcon precisely, perhaps a trifle smaller. I have seen them quite brick-dust red, and again much more highly coloured. They breed in the fells, generally on the ledge of a rock, and the full number of eggs is three.

NOTE.—As this list is intended principally for a guide to the collector and field naturalist, I shall endeavour, as far as I am able, to describe correctly the breeding habits of many species of birds, as well as the nest, number, size, and colour of the eggs, from my own observation. This latter, however, is no easy task, for although a man may be able to give a good general description of an egg, yet all coloured eggs are liable to so much variation, that, with but few exceptions, I will defy a man, in one description, or even in one coloured engraving, to give such a representation of an egg as can be safely relied on. I have now collected in the North for upwards of ten years. Ornithology and oology have been my principal studies, and although during that time thousands of eggs have passed through my hands, including (with perhaps the exception of a dozen or so of the very rarest species) all the birds that breed in Scandinavia, I have never yet been able to form a good *type* collection. All that I can do, therefore, is to describe the egg as it most usually appears when fresh. It is nearly impossible to give an accurate measurement of the egg of any bird. The number stated is always, as far as I know, the general

full number; but except in the sandpipers and plovers, many birds often sit upon less than the full number.

2. Falco Gyrfalco, Nilss. (*Candicans, Islandicus, Greenlandicus, Rusticolus*). Jagtfalk, Sw. The Iceland Falcon. D. F.

Nilsson, who considers this and the last as nothing more than varieties of the same bird, gives us measurements and descriptions of fourteen specimens (some of which doubtless came from Lapland). They appear to comprise all the shades of colour to which this bird is subject, and to vary in size from 20 in. to 27 in. He does not, however, state that a single one was killed on the Scandinavian fells. Some are from Greenland, some from Iceland, and many (young birds) were shot in Scania. Now, this does not help to clear up the point one bit, for no one denies that the Iceland and Greenland birds are subject to great variation in colour, or that this new Norwegian Jer falcon does not resemble the Greenland and Iceland birds *in a certain state of plumage*. What we want to prove is that this dark-coloured falcon which breeds on the Scandinavian fells, when mature, is never so white as either the old Greenland or Iceland falcon, that it is never so large, and that, in fact, at all ages, it more resembles the peregrine than either of the other two named falcons. This can only be done by a careful study of the bird in its native home, and the examination of *undoubted* specimens killed on the Scandinavian fells, at all ages and in all stages of plumage; and this will be a work of time and trouble.

Kjärbölling's description of the three forms is as follows; and I insert his description in preference to Nilsson's, because he clearly identifies the bird he is describing, which Nilsson does not:—

"*Jagtfalk.*—Falco Gyrfalco, L. *Fal. Islandicus*, Lath. *Falco Candicans*, Gmel. (Old Male).—Cere, eye-lids and the large feet, blue; after that greenish; in old age pale yellow. Tail longer than the wings, marked with from twelve to fourteen brown or white transverse bands. Old bird, white above, brown spotted; middle-aged bird brown-grey above

spotted white; underneath yellowish white, with brown heart or lancet-shaped spots. Young bird brown above; below yellowish-white, with brown longitudinal streaks. The old female has white ground colour, but the transverse dark brown bands on the upper part of the body, as well as the longitudinal spots on the lower parts, are more numerous and larger. It is often from three to four inches longer than the male."

"It belongs," he says, "to the northern part of the world, and in summer frequents rocky and wild lands, such as Iceland, Norway, Lapland, the north of Sweden, the north of America, and Greenland. The old birds are stationary; on the contrary, the young birds in the winter often migrate to more southern lands; and, as far as I know, those that are shot in Denmark are only young individuals."

In his appendix he notices the Greenland falcon and the *Fal. Gyrfalco* (Schleg.) thus:—

"*Jagtfalk.—F. Candicans,* Gmel.—This white falcon belongs to Greenland and North America. It is doubtful whether that which breeds in Iceland, and is in general larger, and seldom becomes so white, belongs to this. Brehm, Hancock, and Keyserling and Blasius, have considered them as distinct species. Schlegel, who above all has studied the falcons, finds all the specific distinctions between the two as valueless, and applicable at times to both. According to his opinion, the only difference is in the colour. In the mature Greenland falcon the head, neck, and under parts, as well as the tail (sometimes), are pure white. On the upper parts of the body the ground colour is also white, and the dark colour appears on the back and wings in the shape of heart-formed drops or imperfect transverse bands. The beak is often very yellow; the feet are sometimes pale yellow, or even retain their blueish colour after the bird has assumed its white dress. In the immature Iceland falcon the tail has dark and white transverse bands. The breast and the under tail coverts have small dark streaks. The drop, and heart-formed spots form on the belly and sides small transverse bands. The pale spots on the upper parts

of the body have always the form of more or less developed transverse bands. The pale cross bands on the upper tail feathers are blueish white, and those on the sides of the rump ash grey. The head, neck, and back of the throat have also small transverse bands or streaks. The beak at the root, and the feet are yellow, at least in dry examples. The figure in the atlas represents the island falcon, *F. Candicans Island*, Schl."

Falco Gyrfalco, Schl. Den Norske Jagt falk. F. *Lanarius*, L. *This never becomes white*, but the old bird has, on the contrary, a considerable resemblance to the young Iceland falcon, viz., the female of the first and the male of the last, which resemble each other most in size. This is met with in summer, and breeds, as far as we know, only in the north of Scandinavia. The examination of specimens sent from thence, and information received from residents and hunters living there *have fully convinced* me that *it is a distinct species*. From the young Iceland and Greenland falcon, it differs in its smaller size (in the same sex), in the dark check spot (as in the peregrine), in its yellow-green legs, and by the spots on the under part of the body, as well as on the sides, having the form of transverse bands. It is very probable that even this falcon visits us (in Denmark) more frequently than the foregoing, with which in the immature dress (and only such visits us) it is easily confounded.

I have given above the best and most concise description which I have ever seen of these three falcons, and as to whether they are only varieties of colour of one bird, or distinct species, I can offer no further evidence. I must say, however, that I place as much faith in Kjärbölling on this subject as in any man living, and from what little opportunity I have had of comparing specimens, I am decidedly of opinion that it will turn out at some future day, when the different stages of plumage become better known and authenticated, that this Norwegian Jer falcon is as good and distinct a species as the peregrine.

I do not believe the true Iceland falcon has ever been known to breed in Scandinavia.

3. F. Peregrinus, L. Pelegrims Falk. The Peregrine Falcon. D. F.

Length, about 16 in.; tail level with the tips of the closed wings, which will always distinguish it at a glance from either of the last, in which the tail is always nearly 2 in. longer than the closed wings. *The old bird,* dark ash grey above, with black transverse bars; under parts, reddish white, with dark wavy lines. Tail with nine to twelve transverse bars, a broad black streak under the eyes, and behind that a white one. Head dull blue. Eyes brown. Cere and legs yellow. The young bird is dark brown above, under parts yellowish or brownish white, with brown longitudinal spots. Tail with fewer transverse bars.

In the mature plumage the sexes are much alike.

Is not rare, but certainly very sparingly distributed over our midland forests. It is much more common on the Lap fells, right up to the North Cape. Nest placed either on the ledge of a rock or a high tree. Eggs three, blotched red, much resembling those of the Iceland falcon, but smaller. I always find this a most difficult egg to obtain.

Leaves Scandinavia in the winter, and does not, I believe, breed in Denmark.

F. Lanarius, L. A young specimen, which is said to have been killed in this country, is preserved in the Stockholm museum, but Nilsson does not include it in the Scandinavian fauna, where, in my opinion, it has certainly no right to a place. There is no doubt, however, that at least one young example has been killed in Denmark. Is included in Wright's "Birds of Finland," but he gives no particulars as to locality, date of capture, etc.

4. F. Subbuteo, L. Lark Falk. The Hobby. D. F.

Tail shorter than the wings; first wing feather longer than the fourth. Length of old male about 1 foot. Wing breadth, 31 in.; female a little larger. Cere, legs, and feet, yellow; tail with 10 to 12 bands on the under side; a

small moustache as in the peregrine, which bird it much resembles in miniature. A white spot on the back of the neck. Upper parts all dark black-blue. Throat white. Breast and belly with long black spots. Legs, feathers, and under tail coverts, pale rusty red. The female much resembles the male, but the spots on the breast are thicker and larger. Back darker and duller. In the young birds the red thighs are paler, with dark brown oblong spots. A rusty tinge on the cross bands under the tail.

A summer migrant to the north. Breeds in the south and middle of Scandinavia, but does not go so far up as Lapland.

Eggs—generally in an old crow's nest—red. There is so little difference between the general character of the eggs of the hobby, merlin, and the kestrel, that if a lot were mixed, it would be impossible to know one from the other. Those of the merlin are, however, generally the smallest, and when fresh, have a pinkish tint.

5. F. LITHOFALCO, Gmel. Dverg Falk. The Merlin. D. F.

The smallest of the northern falcons, generally 2 in. shorter than the hobby. Tail longer than the wings. First wing feather shorter than the fourth. Male, light blue-grey above, as also the tail, which has a broad black band, and narrow white tip, but no other cross bands. The female and young are grey-brown above, with the edges of the feathers paler. Below yellowish white, with brown long spots. Tail grey-brown, with five to six pale bands across its upper surface.

Is a summer migrant to Scandinavia, but passes over the south and middle of the country to breed on the Lap fells, where it is very common in the season, as far up at least as Tornea Lapland. Eggs, six,—red. Nearly always laid on the ground among heather.

6. F. RUFIPES Bechst. Röd bent Falk. The Red Legged Hobby. D. F.

Tail exactly of the same length as the closed wings. First wing feather like the third.

Very much resembles the hobby, but the body colour is much darker, and the thighs, feet, and legs, as well as the under tail coverts, are deep red. In the young, rusty yellow, but the young male, in the first year, so much resembles that of both the merlin, and hobby, that it can hardly be distinguished, except by the difference in the length of tail, and the white claw. Although included by Nilsson in the Scandinavian fauna, I do not believe it has ever been properly authenticated in Sweden or Norway. Solitary examples have been shot both in Denmark and Finland. The egg resembles those of the last, but is rounder and smaller.

7. F. TINNUNCULUS, L. Törn Falk. The Kestrel.

Tail longer than the wings by one-fourth; in the male blue-grey, with a black band in front of the pale ash blue tip; in the female, red-brown, with about ten blackish transverse bands. Body colour in the male brick-red, with small black heart-formed drops over the whole upper surface; pinions dark. In the young female the body colour is paler, with dark transverse bands; length about 14 in.

Is by far the commonest of all the falcons in Scandinavia, and builds very frequently in church towers, whence its Swedish name; goes far up into Lapland, but not so far as the merlin. A summer migrant.

Subgen. *Astur*, Bechst. Hawk.

Beak as in the falcon's, but without the pointed tooth; distinguished by the long thin legs, and tail, the latter extending always two-thirds of its length beyond the closed wings; fourth wing feather longest.

8. ASTUR PALUMBARIUS, Keys. Duf Hök. The Goshawk. D. F.

Tarsi stout, of a moderate length, feathered half way down; length 2 ft.; tail nearly 6 in. beyond the wings; iris, gape, and eyelids yellow.

It is always said that the old males and females are of the same colour, ash-grey, with dark transverse spots on the breast. That this is more or less the plumage of very old males I do not deny, but they are extremely rare with us. In *all* the females, however, which I have shot from the nest, and some have been very old (at least very large), the body plumage has been the same, and I take this description, from a very large female shot from the nest, with three remarkably fine eggs, on the 2nd May, 1864. The whole upper part dark shiny brown, rather rusty on the head; secondaries edged with white; tail more grey, with about four dark transverse bands across the upper side; under part yellowish white, with large longitudinal spots on the breast which are much smaller and fewer, though longer, on the belly; thigh-feathers with a pale rusty yellow tinge, and very thin longitudinal dark streaks. This I take to be the general plumage of most of the goshawks, both male and female, that we kill. In both old and young the legs and cere are yellow. I never had the luck to kill a male in the breeding season, when alone we are able to determine by dissection with certainty the male from the female; but that this grey plumage is not the common plumage of the male, but only assumed at a very late period of life, I argue from the fact of their being so very scarce. That the brown plumage becomes greyer from age, even in the females, I know from examination, but probably it is never so ash-blue as in the old male.

Wright observes:—"In stuffed specimens, especially among such as have for a long time stood in a museum, the colour becomes by degrees altogether grey-brown. Even other birds, whose colour when living is grey-blue, undergo a similar transformation when stuffed; on which account it is always safer to study the colours in living, or fresh killed examples."

The goshawk is one of the few of the family that remain in Scandinavia throughout the winter; and Nilsson says, which is probably the case, that it is the young birds which leave the breeding place, and wander away; the old ones re-

main near the nest. The nest is, as far as my experience goes, always in a fir, often on the edge of the forest, or at least pretty open. The eggs, three, usually white-blue, but in the eggs I have just mentioned, one was clear white, the other two dashed faintly with red at the larger end; a very little larger, and more pointed at the ends, than those of the common buzzard. I have taken the eggs in South Wermland, and also in Quickiock, Lapland.

Nilsson remarks that, "in April the change of plumage takes place, when among the feathers on the lower parts of the body which characterize the younger bird (*viz.*, ochre yellow, with dark brown longitudinal streaks), white feathers with dark brown transverse streaks, begin to show themselves." Now by this he clearly means the April of the year after the bird was born, and as he includes both sexes of the old birds in one description—"under white, with transverse wavy streaks," and the young bird "whitish, tinged with rusty yellow, with dark brown longitudinal spots," he surely means that both sexes when adults are characterized by these wavy transverse (not longitudinal) lines on the breast, which appear in the spring ensuing their birth. Now here he is clearly wrong, for the old female which I mention, I am certain from her size, is more than two years old, and there is not the slightest indication of a transverse dark wavy line on the breast; all are longitudinal, and in every specimen I have obtained (except one), this has been invariably the case.

The goshawk is by far the most destructive bird of prey to the Scandinavian game. I have known them strike down a capercaillie, and the hazel grouse appears to be their favourite food.

Subgen. *Accipiter*, Briss.

Tarsi long and slender; feathered only on the upper fourth part.

9. ACCIPITER NISUS, Briss. Sparf Hök. The Sparrow Hawk. D. F.

Tail reaches nearly 3 in. beyond the closed wings; length about 1 ft.

The old female resembles the male in plumage, except that the back and shoulders are less ash-grey and more grey-brown, but the wings and tail are the same.

Adult. Upper parts greyish blue, under whitish, with small long black streaks, and reddish wavy lines on the breast and belly; wings greyish brown, with dark brown bands on the under side; tail blueish grey, with five blackish cross bands, and a white tip.

The young male resembles the old female, but the young female is much browner. Very common from the south of Sweden up to Lapland, but I do not believe it is met with in that country. A few remain even in the middle of Sweden during the winter. Builds in a tree, and the eggs, generally four, are, I think, the handsomest of any bird of prey; white ground very apparent, dashed all over with large deep red brown; blotches often crowded at the large end, and occasionally forming a line round the middle.

Gen. *Aquila,* Briss.

Head with flat crown, as well as the neck, clothed with long pointed feathers; beak long and strong, with a sharp hooked point; wings long and broad, reaching nearly to the end of the rounded tail; third and fourth feathers longest.

Land Eagles.

Tarsi feathered right down to the toes, the middle toe joined to the outer one by a web as far as the first joint.

10. AQUILA CHRYSAETOS, Cuv. Kungs Örn. The Golden Eagle. D. F.

Length near 3 ft.; wing breadth 6 ft.; tail in the male 12 in.; does not reach beyond the closed wings; in the female 15 in., extending beyond the closed wings; head and neck above brownish yellow; chin and throat black; body above dark brown, more or less tinged with grey, under blackish, with or without a rusty tinge; in the

young bird, tail rounded, longer than the closed wings, and from the root white, two-thirds of its length; or in the old bird, scarcely longer than the wings, and grey marbled from the root two-thirds of its length, and after that blackish brown.

Is certainly rare in Scandinavia, although it remains here the whole year, for I have known them caught in the winter in wolf-traps, in Wermland. I never took the nest myself, but the eggs are in general two, hardly so large as those of the white-tailed eagle, but always more richly blotched with red-brown. They are very difficult to procure.

11. A. NÆVIA, Briss. Små Örn. The Spotted Eagle. D.

Smaller than the last, tarsus longer and thinner. Length rarely exceeding 2 ft. Head greyish brown; body colour brown above, with or without white spots; below rusty grey, with or without longitudinal streaks. Tail never longer than the closed wings, altogether brown (neither white or grey at the root), but the top side is marked with about six, more or less distinct transverse bars.

Is only an accidental visitant to the North, but specimens have been killed both in Sweden and Denmark, although never in Finland.

Subgen. *Haliaetos*, Sav.

Tarsi only feathered down half their length. The web between the toes scarcely perceptible.

Sea Eagles.

12. HALIAETOS ALBICILLA, Sav. Hafs Örn. The White-tailed Eagle. D. F.

About the same size as the golden eagle; colour dark brown or brown-grey; tail in the old bird white throughout its whole length, and not longer than the wings. In the young bird speckled with grey, and longer than the wings.

The older the bird becomes, the paler is the brown-grey body-colour, and the lighter the head and neck.

It seems that in Scandinavia there are two forms of this eagle which some have fancied distinct species. The one, the *F. ossifraga*, said to be peculiar to the far north, is larger than the southerly form (*F. albicilla*), measuring sometimes 8 ft. between the wings. It is, however, most probable that the *ossifraga* is nothing more than the young of the *albicilla*, for in the eagles, the young in general are larger than the old ones of the same sex. The reason of this is, that the bones in the older birds are thinner and more drawn up than in the young, and it is a common rule that the tail is shorter in the older birds. This eagle is, I fancy, far more common in Scandinavia than the golden eagle; it is dispersed pretty generally but sparingly over the whole country, and in the winter congregates much on the southern coasts, so that in a small island off Engelholm I have counted seventeen together. The nest is generally in the neighbourhood of water; eggs two (very rarely three) laid in April, dirty white. About 3 in. long by 2 in. thick.

Subgen. *Pandion*, Sav. Osprey.

Beak much smaller than in the true eagles; tail round and compressed, shorter than the closed wings; nostrils outwardly covered with a web; toes underneath rough, for the purpose of grasping; the outer toe free, moveable; tarsus strong and short; second and third wing feathers longest.

13. Pandion Haliaetos, Sav. Fisk Ljuse. The Osprey. D. F.

Legs and cere always pale blue, never yellow, as in the eagles; all the upper parts of the body dark brown, underneath white. Length about 2 ft.; tail shorter than the wings, with dark bands across the outer feathers; iris yellow.

Is tolerably common and pretty generally dispersed throughout all Scandinavia, to far up within the polar circle. Nest generally on an old pine, somewhere in the neighbourhood of water. Eggs smaller and more oblong

than those of the eagles, but far handsomer; ground colour clear white, which is often very apparent. Blotched all over with deep red-brown. Full number three.

The *Falco brachydactylus*, Tem., the short-toed eagle. (Bree), is included in the Danish fauna, and is said to have once bred in Schleswig.

Milvus, Sav. Kite.

Tail long and deeply cloven; third and fourth feathers of the wing longest.

14. Milvus Regalis, Briss. Glada. The Kite. D.

Length a little over 2 ft.; head and neck whitish, with brown streaks; body colour above, light reddish brown with paler feather edges, under parts rusty grey, with dark longitudinal streaks; tail, which is 13 in. long (reaching at least 3 in. beyond the long pointed wings when closed) red-brown, indistinctly marked with small dark bands on the under side. Iris in the old bird pale yellow, in the young bird pale grey.

Is a summer migrant, and tolerably common in the south and middle of Scandinavia, but does not go very far north. Next to the lark, is about the earliest migrant that arrives. I saw a kite in Wermland on March 23rd, 1864, but it was no herald of spring, for after that we had a very heavy snow storm, and night frosts for six weeks.

The egg of the kite is most difficult to obtain, properly authenticated; and I have no doubt that of the common buzzard, which is far more easily obtained, is often substituted for it. They both breed with us in trees. The full number of eggs in both nests three, and the eggs are much alike, ground colour whitish, blotched more or less with red-brown. Is not known in Finland.

The black kite is included in the Danish fauna, but only in the very southern provinces.

Buteo, Cuv. Buzzard.

Beak rounder and smaller than in the kite; head thick;

body plump and round; wings round; fourth feather longest: tail rounded, scarcely longer than the closed wings.

15. BUTEO VULGARIS, Bechst. Örm Vråk. The Common Buzzard. D. F.

Wings equal to the tail in length, the latter having about twelve grey transverse bands on a dark brown bottom; shafts of the wing, and tail feathers white. Little difference in the colour of the male and female (but the latter is largest), and just as little difference in plumage between the old and young birds. They vary very much in colouring; body colour usually dark brown; breast and belly often transversely marked with white. Length about 20 in.

Is a spring migrant to the north, and certainly one of the commonest of the birds of prey, especially in the middle of Scandinavia. I never met with it in Lapland, nor do I believe that it goes so far north.

16 BUTEO LAGOPUS, Brün. Fjösbent Vråk. The Rough-legged Buzzard. D. F.

May at once be distinguished from the common buzzard, by the tarsus being feathered nearly to the toes, and by the root of the tail being white, two-thirds of its length. A little larger than the last, and the colour lighter; but they vary much. Tail scarcely longer than wings.

A summer migrant, and only seen in the south and middle of the country during the periods of migration. Its principal breeding haunts are the Lapland fells; and to prove how common they are in some places, I may mention that in one season, 1862, just round Quickiock, I am certain more than thirty nests were destroyed. I generally found the nest placed on the ground, on the ledge of a rock, but occasionally in a stunted tree. I may notice that, although you never meet with this bird breeding in the forests at the bottom of the fells, it does not seem to go far above the limits of the forests, never into the snow region. Goes up

to the far north of Lapland; common over all Finland. I take three to be the general number of eggs, although I have found more in a nest. The egg very much resembles that of the last, but is generally deeper coloured, with, if I may use the term, a bolder character. I have, however, seen specimens of both quite white.

Subgen. *Pernis*, Cuv.

Tarsi half feathered. The nose between the eye and the base of the beak, covered with a little close plume of feathers, instead of bristles, as in every other bird of prey.

The above characters will always distinguish this buzzard from any other.

17. PERNIS APIVORUS, Cuv. Bi-Vråk. The Honey Buzzard. D. F.

About the size of the last; tail two inches beyond the closed wings, greyish-brown, with three or four large broad dark bands, and several smaller. The body colour varies so much, that it is difficult to give even a good general description; usually grey-brown, lightest on the head; breast white, barred with brown. When flying, it may be distinguished by the wings appearing white underneath, the feathers tipped with black, and having dark transverse bands. The male may always be known by the smaller size and the light ash-blue head.

Is sparingly dispersed during the summer over the middle of Scandinavia; is said to breed also in Lapland, but I could never either see or hear of it there. With us in the middle of Sweden, they go to nest latest of any of the genus, and we rarely find eggs till June. I often take the nest of the common buzzard early, or in the middle of April. Nest of the honey buzzard usually placed in a fir, invariably, as far as I can see, in a small forest mixed with much birch; and in every nest which I have seen I have observed some green birch boughs interwoven with the dry fir sticks, of which the nest is chiefly composed. Eggs, two. I never saw more; very like

those of the peregrine, but perhaps rounder. I have seen them of a uniform red colour, and again with a white ground with large red blotches, sometimes forming a crest, sometimes a zone, around the middle. This latter form of egg is remarkably handsome.

Subgen. *Circus*, Sav. Harriers.

Distinguished by the disk of feathers round the face; something like the owls, the long thin legs, and long pointed wings, shorter than tail; third and fourth feathers longest. Frequent low, marshy, fenny tracts.

18. Circus æruginosus, Lath. Rostbrun Kärr hök. The Marsh Harrier. D.

Head whitish or rusty yellow; upper parts of the body brown; thigh feathers rusty yellow; under parts soot brown, with a broad rusty band over the breast; the under side of the wings grey-brown, without transverse bands; tail and secondaries ash grey in the male, brown in the female. Length 22 in.

All the harriers are summer visitants to the North, and none of them so common as might be expected from the nature of the country. All build their nests on the ground in marshy situations, and lay from three to four blueish-white eggs, more elongated than any other of the hawks.

The marsh harrier is more common in the south of Sweden and Norway than any of the others, but does not appear to have a very wide northerly range. Is not known in Finland.

19. C. Cyaneus, Cuv. Blå Kärr hok. The Hen Harrier ♂. The Ring Tail ♀. D. F.

Upper plumage in the male blue-grey; under white, unspotted; wings underneath, from the root to the middle, white, then black. Length 18 in. Female brown above; below rusty yellow, streaked longitudinally with brown; wings underneath transversely barred with black and white. Length 20 in. Feather disk

large and apparent; third and fourth wing feathers the longest; the tip of the second comes much nearer to that of the fifth than of the third; first and seventh alike; tail longer than the wings; upper tail coverts pure white.

Is certainly commoner than the last, in the midland districts, and appears to go much further north, for specimens have been shot up at Munioniska, in Tornea Lapland. Is spread over the whole of Finland.

20. C. Cineraceus, Mont. Mindre Kärr hok. Montague's Harrier. D. F.

Very much resembles the last, but is smaller. Male and female, subject to the same variation in plumage, but in the male, the white under-plumage is spotted and barred with rusty brown. Length from 15 to 17 inches. To distinguish this species from the last, observe that the tail is even with the closed wings; the feather disk is not nearly so plain; the third wing feather is the longest, and the tip of the second comes much nearer that of the fourth, than of the fifth; first like the sixth; upper tail coverts with grey transverse bands.

Is accidental in Scandinavia and Finland, but more common in Denmark, where it breeds. Has probably been hitherto confounded with the last.

21. C. Pallidus, Sykes. Blek Kärr hok. F.

Resembles the last in size and appearance. Subject to the same variation in plumage, but the male may always be known by its pure white throat and chest (whence its English name), which in both the two last species are blue ash. The feather disk is indistinct, unspotted. The tail is considerably longer than the closed wings; the third wing feather longest; the tip of the second comes nearer that of the fourth, than of the fifth.

Accidental specimens have been shot both in Gothland (where they are said to breed), and also near Gothenburg, but all have been females. Two examples have been shot in

Finland, both males. Not known in Denmark. Figured by Dr. Bree as the pale-chested harrier.

NOCTURNAL BIRDS OF PREY.

Fam. 2.—STRIGIDÆ. OWLS.

Eyes large, in front of the round head, surrounded with a disk more or less perfect, of stiff hairy feathers; beak small; plumage soft and downy; legs always thickly clothed with soft feathers.

By some naturalists this family is subdivided into no less than four, and nine genera. I think it far better and simpler to follow Nilsson, and separate it into two divisions—the diurnal and nocturnal owls. All lay white round eggs, either in holes of trees or in clefts of rocks, very few troubling themselves to make a nest.

1.—*Diurnal Owls.*

Ear openings oval, of a moderate size, and with no flap or covering. Feather disk small, and divided at the top. The form of the body appears smaller, because the feathers are not so downy as in the nocturnal owl, and the head is smaller in proportion.

Noctua, Sav.

A.—With no perceptible ears or horns on the forehead.

22. STRIX NYCTEA, L. Fjäll Uggla. The Snowy Owl. D. F.

Length about 2 feet; tail 2 inches longer than the wings. All the body plumage white, more or less spotted with blackish grey; head small; beak and claws black; eye orange-yellow. The old birds are nearly pure white; the younger more or less spotted. Unlike any other owl, the young of which obtain their full mature plumage at the first autumnal month, the snowy owl does not arrive at its mature white dress until after several moults.

The peculiar home of the snowy owl is on the snow-clad summits of the Scandinavian fells, although in the

winter individuals, principally younger birds, wander to a distance, and solitary examples are then shot in many parts of the country. It is a fine bold bird, and its solitary habits and loud shriek, "krä-u, krä-u," are in perfect keeping with the wild regions which it frequents. It is a very erratic bird, and its wanderings are much dependent on the migrations of the lemming.

The nest, placed on the ground, often on a projecting rock, is a large ball of reindeer moss, and a few sticks. Eggs six or seven; rather elongated, perfectly white. The nest I took in Lapland, on June 2, contained six eggs. The old female we shot was nearly pure white.

23. Strix Funerea, Lath. Hök Uggla. The Hawk Owl. D. F.

Length about 15 in.; the pointed tail reaches 3 in. beyond the closed wings. Whole body colour, brown; darker or lighter dependent upon age and season; covered all over with white spots, especially on the shoulders and head.

Is certainly in Lapland the commonest of all the owls. But although never a winter passes without our obtaining two or three specimens in the middle of the country, the northern forests, at the foot of the fells, are its proper home, and I never could hear of its breeding any where else. In habits and flight this bird much more resembles the falcons than the owls.

The full number of eggs, according to my experience, is six, although I have taken more out of a nest; and in size and appearance they often much resemble those of the short-eared owl. Usual size $1\frac{1}{4}$ by $1\frac{1}{8}$. I never took them from any other place than out of a hole in a dead fir or pine, and this is quite contrary to the information which other naturalists give us of the breeding habits of this bird. No signs of a nest; eggs always laid on the rotten wood, like the Woodpecker's. Go to nest in the end of April.

24. S. Passerina, L. Spärf Uggla. F. D.

This is the smallest of all European owls; scarcely 7 in.

long; and 11 in. across the wings. May at once be distinguished from the British little owl by its toes being covered with thin bristles instead of feathers, by the length of the tail, which extends nearly 1¼ in. beyond the closed wings, by a difference in the comparative length of the wing primaries, and by its toes being thickly covered with small feathers. Upper plumage grey-brown, strewed all over with whitish spots; underneath lighter, with longitudinal streaks; tail with four white bars, and white tip; colour of the sexes alike; iris bright yellow.

I fancy this little owl is much more common in Scandinavia than the Swedish naturalists suppose; and although I never obtained the nest, I know they breed both in South Wermland, and also at Quickiock, Lapland. What the egg is like, I cannot say, but as I obtained four young ones which could scarcely fly, out of the same family, at Quickiock, we may take it for granted that Temminck is quite wrong, when he says that the full number of eggs is two.

Is one of the earliest birds in our forests, and the note, one shrill whistle, like blowing into a key, followed by a number of finer notes, "ti-weet, ti-weet, ti-weet," is heard during the pairing season, in March and April, long before daybreak.

Figured by Dr. Bree as the "Least European sparrow-owl." Only accidental in Denmark. Common in the south and middle of Finland.

25. S. NUDIPES, Nilss. Minervas Uggla. The Little Night Owl. D.

Has no more right to a place in the Scandinavian fauna than the common barn owl. But one specimen of each is recorded to have been taken in South Sweden. Pretty common in some parts of South Denmark.

Bubo, Cuv.

B.—With feather tufts, or horns, on the forehead.

26. S. BUBO, L. Berg Uf. The Eagle Owl.

Length about 2 to 4 in.; tail rounded, 2 in. longer than

the closed wings; horns 2 in. high. Colour, above black, speckled with rusty yellow and grey; below rusty yellow, with black streaks and small wavy lines on the belly and sides. Little difference in the plumage of the sexes, save that the white spot on the chin is much purer and larger in the male.

The eagle owl is sparingly distributed throughout all Scandinavia, to far up within the Polar circle. I have found the nest on a rock, and also in a small tree. Eggs three; the largest of all the Northern owls' eggs.

Like all the owls they go to nest early.

I am very fond of having this bird in confinement, and am rarely without one or a pair. Of all pets they are the least trouble. I never knew them want any water, and they are satisfied if they get a good meal once a week. Although diurnal, like the little owl, it is only at night when they wake up, and the measured "boo, boo," of the eagle owl, like the distant bark of a gruff old watch dog, is heard throughout the whole summer night by any one who chances to intrude on the vicinity of their eyrie. Next to the gos-hawk, I think the eagle owl is the most destructive of all the birds of prey in these forests. Blackcock, hares, capercaillie, and even the cunning fox, fall a prey to them; and as the young lie long in the nest, they require a deal of food. Is said to breed in Denmark, but I fancy very rarely.

2.—*Nocturnal Owls.*

NOTE.—Although Nilsson, perhaps properly, includes the short-eared owl, and the lap owl, in this division, I may remark that both these species can hunt by daylight as well as by night. In fact, in the high Polar regions which both frequent, for three months in the year, the nights are as light as day; and I believe the glare of daylight quite as little affects their eyes as it does those of the eagle owl.

Gen. *Ulula*, Bon.

Ear openings large, half-moon shaped, furnished with a cover or flap; feather disk large, perfect; size of the head very large; feathers silky.

(1.) With horns on the forehead.

27. Strix Otus, L. Skogs Uf. The Long-Eared Owl. D. F.
Length about 14 in.; tail 1 inch shorter than the wings; with six to eight transverse bands. No difference in the plumage of the sexes, save that the female is much lighter coloured. Horns projecting about 1¼ in. beyond the head feathers. Body colour, above speckled brown, rusty yellow, and grey; below rusty yellow, with long brown streaks.

Is common throughout the south and middle of Sweden, but does not go up into Lapland. Rare in Finland, and only met with in the south.

28. S. Brachyotus, Lath. Kort Örad Uf. The Short-eared Owl. D. F.

This is the only one of the true Swedish owls which leaves the country in the winter, and returns in spring to breed on the Lapland fells, strange to say, passing over the south and middle of the country, where thousands of acres of heather are to be found, apparently quite as well suited to the breeding habits of this bird as the northern British moors, where they are not uncommon in the summer.

The ear-feathers hardly perceptible till they are raised with the finger. Length about 13 in. Colour much like the last, but lighter and handsomer. The tail, however, is scarcely half an inch shorter than the closed wings, and has but three or four brown cross bands. The eye is moreover entirely encircled in black; in the last there is only a black patch in the front of the eye. The iris in both is yellow.

I never found the nest any where but on the Lap fells, where these birds are tolerably common in the summer; and I have often been amused, as I lay by my camp fire, in watching their airy gyrations, much resembling the flight of the peewit over their breeding grounds, during the whole of the light summer's night. The eggs, six, always placed on the ground; nest a few bits of dry grass scratched together.

(2.) Without Ears.

29. S. Lapponica, Sparrm. Lap. Uggla. F.
Length a little over 2 ft.; tail rounded, the side

feathers 1¼ in. shorter than the rest, and 3 in. longer than the closed wings; the body, however, is small, the weight of the whole bird not exceeding 4 lb.; the circle round the eye ash grey, with dark cross bands; whole upper plumage speckled with dark and yellowish brown, under whitish, with brown longitudinal streaks; tail long, pointed, grey-brown, with grey cross bands and dark tip; iris brilliant yellow.

The home of this rare and most beautiful of all the northern owls is the very north of Scandinavia, from whence it rarely wanders, although I once obtained a very fine specimen killed in the winter in South Wermland.

The Lap owl is a true forest owl, and is never seen higher up on the fells than the limits of the forests; nest generally in a high fir or pine. I do not know whether it is built by the bird itself, most probably not. I never saw the egg, save one which Mr. A. Newton kindly gave me. This egg was rounder and more elongated than that of the eagle owl. It was taken at Muncovara, and the nest contained seven eggs.

30. S. Liturata, Gm. Slag Uggla. D. F.

Length 1 ft. 11 in. English; breadth of wings 3 ft. 9 in.; length of tail 12 in., extending beyond the closed wings 5 in. First wing feather a little shorter than tenth; second like seventh; third rather shorter than sixth; fifth longest; colour rather resembling that of the brown owl, but much more uniformly grey without any tawny tinge. The long pointed tail will always distinguish this owl from any other.

Is certainly the rarest of all the Scandinavian owls, and never appears to go so far north as the last. It is never, however, met with in the south of the country. In April, 1864, I shot a remarkably fine female in South Wermland, and I do not think one was ever shot so far south before. I do not believe it is met with in Lapland. Is included in the Danish fauna, but I think on very doubtful authority. My description is from a fresh killed specimen, a thing which very few naturalists have had the opportunity of observing. Eye

dark (appeared blueish black), not as I have seen it depicted in every coloured figure except Kjärbölling's, bright yellow. Of its breeding habits (at least in Scandinavia), nothing is known, and I do not believe any collection contains a well authenticated egg of this bird. Figured by Dr. Bree as the "ural owl."

31. S. ALUCO, Gm. Katt Uggla. The Brown Owl. D.

Length 14 in.; breadth of wings 2 ft. 10 in.; tail 6 in., extending about 2 in. beyond the closed wings; iris black; colour above speckled with brown-grey, rusty yellow, and white, with long brown spots; below whitish, with long blackish brown streaks, and a rusty white spot on the shoulder. The female is always more red-brown than the male, especially on the back, where the male is grey and white. I fancy that this owl never attains so red a tint in Sweden as in more southern climes. First wing feather like the tenth, much shorter than second; second shorter than sixth; third shorter than fourth, which is equal to fifth, and longest.

Is the commonest of all the Scandinavian owls, but confined, I think, to the middle and south of the country. Is not included by Wright in his "Birds of Finland," and does not appear to be known in Lapland.

32. S. TENGMALMI, Gm. Perl Uggla. Tengmalm's Owl. D. F.

Length 10 in.; breadth of wings 22 in.; tail 4 in., reaches scarcely 1 in. beyond the closed wings; iris clear yellow; colour brown above, with white spots; below white, with brown transverse bands; a ruddy tinge over the breast, which, as in the female hawk owl, is most conspicuous in the breeding season.

Independently of its much greater size (for the head and body appear double as large), this owl may always be distinguished from the *Strix passerina* by the eyes being encircled with a pale white colour, and in the *S. passerina* by a dark circle.

The young which I have shot just after leaving the nest

are very unlike the old birds. The whole colour dark sooty brown, the white spots very faint and indistinct.

This little owl has a wide breeding range in Scandinavia, at least from South Wermland to far up within the Polar circle, and has even been met with in winter in the extreme south. Only accidental in Denmark, but in Finland, next to the hawk owl, is the commonest of all the owls. The eggs six, coarse textured, rather elongated; are always laid in a hollow tree, about April; usual size 1⅜ by 1 in.

33. S. Flammea, Gm. Torn Uggla. The White Owl. D.

Wings longer than the tail; iris dark brown; length 14 in.; colour, upper parts ash grey, finely watered and marked, with very small black and white spots; under parts rusty yellow, with very small black spots.

An accidental specimen was shot from the mast of a ship in Ystad harbour, South Sweden, in 1834, and on this account the bird has been added to the Scandinavian fauna. Not known in Finland, and rare in Denmark.

ORDER 2.—SYLVICOLÆ, Veil.

This is by far the most comprehensive order in the whole class of birds, and perhaps the hardest to divide. We cannot do more in this limited space, than define the birds belonging to this order generally as having feet formed for perching, with claws not adapted to tear asunder their prey, and beaks without a naked cere, as in the last. I do not consider Nilsson's arrangement of this order as by any means the best, but as I follow his arrangement throughout, I adopt it here.

1st Sub-Order, *Zygodactyli*.—Two toes in front, and (except in very exceptional cases) two behind.

Scansores. Climbers.

Fam. 1.—Picidæ. Woodpeckers.

Gen. *Picus*.

Beak long, wedge-shaped; tail (except in the wryneck)

stiff and pointed; tongue very long, with a horny tip, capable of being drawn out of the beak to a great length. All lay their eggs, pure shiny white, in the hole of a tree. This family is represented throughout the whole world, with the exception of New Holland.

34. PICUS MARTIUS, L. Spill Kråka. The Great Black Woodpecker. D. F.

All the woodpeckers remain in Scandinavia throughout the whole year. Length 18 in.; wing breadth nearly 30 in.; tail 8 in., extending beyond the wings about 3 in.; body colour deep black. In the male the whole crown of the head, in the female only a patch on the back of the neck, deep crimson; eye in the younger birds straw yellow, in the older ones white.

Is common throughout the whole of Scandinavia, from the extreme south to far up within the Polar circle. Goes to nest the earliest of all our woodpeckers, in April. Eggs five, generally a little larger than those of the green woodpecker, but often so much resembling them as to be with difficulty distinguished.

Like all the other woodpeckers, the male sits on the eggs as well as the female. I have taken three clutches of eggs (in all fifteen) in one season from the same pair of birds. The cry of the great black woodpecker is a loud wild "pey-oh!" and is generally heard before rainy weather.

35. P. VIRIDIS, L. Grön Hack Spett. The Green Woodpecker. D.

Length about 14 in.; tail extending 2¼ in. beyond the closed wings; eye white; legs lead coloured; body colour green above, with a red head, and black tract around the eye; under parts greenish grey; all the tail feathers with pale transverse bands. In the male a red stripe from the gape backwards, which is wanting in the female, and the red on the head is not so vivid.

Is more common in the south of Scandinavia than the last, but rarer in the midland forests; is not known either

in Lapland or Finland. I fancy about five is its general full number of eggs.

36. P. Canus, Gm. Gråhöfdad Hack spett. F. D.

Body colour green; whole top of the head grey, only in the male the front of the crown is red. Length about 12 in.; iris red; legs greyish green.

Is nowhere so common as the last, and appears to be confined to the middle of this country. Is not met with in Lapland. Not rare in the middle and south of Finland, and only accidental in Denmark. Appears to be common throughout all Siberia. In winter comes much about houses, and I often see them scrambling about the gable ends of the peasants' wooden cottages.

The egg much resembles that of the last, but not so bulky. Figured by Dr. Bree as the grey-headed woodpecker.

37. P. Leuconotus. Bechst. Hvitryggig Hack spett. F.

Length about 11 in.; breadth of wings 17 in.; tail extends 1¼ in. beyond the closed wings. Iris nut-brown; legs lead grey; colour black and white variegated, the hinder part of the back pure white; breast and sides of the belly with dark long streaks; belly and under tail coverts rose red; crown of the head in the male red, in the female black.

Is nowhere very common, and I fancy very local, principally confined to the midland forests, and seems more partial to birch than to fir woods. Has been occasionally shot in the south, but I never met with it further north than near Umea. Strange to say that this woodpecker should never have been identified in Denmark, where the last is not unfrequently seen. Eggs 6, a very little larger than those of the *P. major*. Figured by Dr. Bree as the white-rumped woodpecker.

38. P. Major, L. Större Hackspett. The Great Spotted Woodpecker. D. F.

Length 10 in.; black and white variegated; the

back and rump black, a white spot on each shoulder; head above black, a deep red patch on the back of the neck in the male, which is wanting in the female; under tail coverts carmine red; sides dirty white, unspotted.

In the young the top of the head is red in both sexes, until the first autumnal month, and at this age they may easily be confounded with the *P. Medius*, but may be distinguished by their larger size and much thicker beak. That the *P. medius*, however, is not the young of the great spotted woodpecker, as some have erroneously supposed, is pretty clearly proved by the fact of this latter bird, always retaining the crimson colour on the top of the head through life.

Is common in all the Scandinavian forests, from the extreme south to far up into Norway and Lapland. Full number of eggs six. Nests in Wermland in May.

39. P. MEDIUS, L. Mellan spett. D.

Length about 8½ in.; general colour very similar to the last. But the sides of the old birds are covered with longitudinal dark lines, and the upper part of the head and neck is red at all ages in both birds (but not so bright in the female). Iris brown, encircled with a white ring.

Is confined to the extreme south of Sweden, and we never meet with it in Wermland. Frequents principally plantations of oak and aspen.

Is much more likely to be confounded with *P. Leuconotus* than with *P. major*, in my opinion. Eggs six, scarcely smaller than those of the *P. major*. Figured by Dr. Bree as the middle-spotted woodpecker.

40. P. MINOR, L. Lilla Hack spett. The Lesser spotted Woodpecker. D. F.

Length 6 in.; black and white variegated; back white, with black transverse bands; crown of the head in the male carmine red, in the female dirty white.

Is distributed over the whole of the middle and north of Scandinavia to far up into Lapland, but does not appear to be ever seen in the extreme south, except during the

winter. Was as common in Quickiock as the black woodpecker. The great pied woodpecker was rare there. I never saw the white-rumped, the green, or the grey-headed woodpeckers so far north as Lulea, but the commonest in all the Lap forests is the three-toed woodpecker.

Goes to nest the latest of all the woodpeckers. General number of eggs five, which can scarcely be distinguished from those of the wryneck; but when authentic eggs of the two are laid together, those of the wryneck are of a much more chalky white, and altogether want that transparent gloss which characterizes the eggs of all the true woodpeckers.

But the oologist must be very careful how he admits the egg of any of the woodpeckers into his cabinet without a proper identification.

41. P. Tridactylus, L. Tretaig Hack spett. The Three-toed Woodpecker. D. F.

With three toes, two in front, one behind. Length about 9 in.; colour black and white, piebald; crown of the head in the male golden yellow, in the female black and white spotted; iris brown; legs lead coloured.

Is common during the breeding season from the north of Wermland up to at least Tornea Lapland. In the winter they wander further south. I have remarked that they are most partial to such forests as have been destroyed by bush fires; very common in Finland. Appears only to have been once observed in Denmark, and to have been admitted into the British fauna on extremely doubtful authority.

I never found more than four eggs in the nest, but I do not say that this is the full number. In Lapland they do not go to nest until June, the latest of all the woodpeckers.

Gen. *Yunx*, L.

Feet and tongue as in the last, but the tail is long, and square at the end, with soft feathers.

42. Yunx Torquilla, L. Gök tyta. The Wryneck. D. F.

Length 7 in.; colour above grey, beautifully variegated with black, white, and rusty streaks and spots; below rusty yellow, with dark transverse lines. Iris brown-yellow.

Is a summer migrant to Scandinavia, and met with in all the southern and midland districts, but does not go up into Lapland or North Finland.

Eggs in general more in number than any of the woodpeckers. I never met with them breeding in deep forests, generally in gardens or avenues near houses.

Fam. 2.—Cuculidæ, Bp. Cuckoos.

Beak slightly curved downwards; tongue short, weak; legs short; the outer front toe reversible.

Gen. *Cuculus*, L.

Beak shorter than the head; nostrils lateral, round, surrounded by an elevated skin. Tail long, rounded with ten feathers.

43. Cuculus canorus, L. Gök. The Cuckoo. D. F.

Length about 14 in.; tail 7 in., extending 2 in. beyond the closed wings; colour, above blue-grey; breast and belly white, with blackish wavy lines; tail blackish, with white spots and tip; gape, eyelids, iris and legs, bright yellow.

The old female is smaller than the male, and her colour less grey-blue and more grey-brown. The young of the first year are reddish brown.

The breeding habits of the European cuckoo are well known to all. The nests usually selected in this country in which the female deposits a single egg are the wagtails', pipits', and some of the warblers. The egg of the cuckoo is round and blunt, and though the usual colour may be described as being dirty white, speckled all over with ash or nutmeg brown, I have often observed a great similarity in the general colouring of the egg deposited by the female cuckoo with those of the intended foster-mother.

2nd Sub-Order, *Anisodactyli.* — With unequal toes. Three toes in front, one behind, the outer toe generally grown up with the middle toe.

Fam. 1.—ANGULIROSTRES, Ill.

Legs very short, naked above knee; all front toes grown together at the bottom; beak below and above edged. All the birds belonging to this family frequent the neighbourhood of streams. They lay their pure white, round, shiny eggs, usually six, in a hole in a bank.

Gen. *Alcedo,* L.

Beak straight, long, pointed; legs short; body small, plump; wings and tail short; colouring always brilliant, and no difference between the plumage of the sexes.

44. ALCEDO ISPIDA, L. Blä ryggig Isfogel. The Kingfisher. D.

Length 7 in.; colour on the back beautiful azure blue; head and wings strewed with azure blue spots; under parts, and a streak through the eyes, rusty red.

Is exceedingly rare here; and although occasionally seen in the southern provinces of Sweden, has never, I believe, been detected breeding in Scandinavia. Is said to breed in Denmark. Many years since I was standing below the falls of Trolhattan, and I saw a king-fisher dash down the stream. I scarcely deemed the circumstance worth notice, for I did not know then how rare this bird was in Sweden. I have never seen one since. This was in the autumn.

Is generally but sparingly dispersed over the whole of Denmark, and I could never account for its scarcity in Swedon—a country apparently so well suited to its habits. Its place in the latter country appears to be taken by the water-ousel, a bird which is very rare in Denmark during the summer.

Gen. *Merops,* L.

Beak long and crooked; wings long and pointed; tail

long, the two middle feathers considerably longer than the others.

45. MEROPS APIASTER, L. Bi atare. The Bee-Eater. D.

About the size of a common thrush. Back and wing coverts brown-red; throat yellow, encircled with black; body underneath sea-green. The two middle tail feathers nearly one inch longer than the others.

Has only been killed accidentally in the south of Sweden, and is very rare in Denmark. Does not breed in either country.

Fam. 2.—TENUIROSTRES.

Beak long and thin, either bent or straight; legs short; toes divided.

Gen. *Upupa*, L.

May always be known by the long beak curved downwards, and the high crest of feathers on the top of the head.

46. UPUPA EPOPS, L. H r fogel. The Hoopoe. D. F.

Length about 11 in. Back and wings black, with yellow-white transverse bands; tail black, with one white transverse band; breast, head, and front of the back, reddish grey, with a rusty yellow tinge; crest on the head rusty yellow, with black tips.

Is a migrant to Scandinavia, and is distributed but partially and rarely over the south of both Sweden and Norway, where it breeds, according to Nilsson. I have never seen the bird here, nor met with any one who has. Is very rare, even if it has yet been properly identified, in Finland. Breeds in South Denmark.

Gen. *Certhia*, L.

Beak long, very thin and bent; tail wedge-shaped, stiff, like the woodpecker's; wings short and round; feathers soft.

47. CERTHIA FAMILIARIS, L. Trä Krypare. The Creeper. D. F.

Length 5 inches. Above brown-grey, with oblong

white spots; under parts white; a yellow-white band over the wings.

Is met with both in the south and middle of Sweden, and also in South Finland and Denmark, and remains in all these countries throughout the year; but is everywhere sparingly distributed.

Gen. *Sitta*, L.

Beak straight, conical; tail even, weak, consisting of twelve feathers.

48. SITTA EUROPEA, L. Not väcka. The Nuthatch. D. F.
Length about 6 in. Grey-blue above, with a black streak through the eye; below whitish; the two middle tail feathers blue-grey, the rest black.

Remains in Scandinavia throughout the year, but is nowhere very common. It is not exactly known how far north it goes, but certainly as far as Upsala. Has only twice been seen in Finland. Common in Denmark. It is now, I believe, allowed that the *S. Cæsia* (Mey.) is nothing more than a variety of the common nuthatch.

Fam. 3.—GREGARII, Ill.

All the members of this family are more or less gregarious in their habits, and omnivorous.

Gen. *Corvus*, L. Crows.

Bill strong, thick; upper mandible slightly bent at the top; nostrils basal oval, generally covered by bushy feathers; wings pointed, fourth feather longest; feather covering hard and fast. Mode of progression a stately walk.

1. *Corvus*.—Tail moderately rounded.

The wild nature of this country is peculiarly adapted to the habits of this old-fashioned bush-ranging bird, which is met with everywhere, from the very south of Scania to the north of Lapland.

49. CORVUS CORAX, L. Korp. The Raven. D. F.
Length 2 ft.; wing breadth more than 4 ft.; tail

wedge-shaped; the closed wings 2 in. shorter than the tail, and half an inch shorter than the side tail feathers. Colour black, with purple gloss; iris with two circles, of which the inner is grey-brown, the outer white.

The eggs of all this genus have the same character, blueish green, or pale greenish grey, with dashes, stains and spots of a darker shade. Build either in trees or on rocks. Number of eggs from five to six. The eggs of the raven are, of course, much larger than those of any other species.

50. C. Cornix, L. Grå Kråka. The Hooded Crow. D. F.
Length 18 in. Body colour ash grey; wings and tail black. First wing feather shorter than ninth.

Is very common throughout the whole land during the summer months, although I fancy many leave the country altogether, and return with the starlings in March. A great many remain in the south, and even in the middle of the country, if the winter be open. Breed in woods solitarily, far inland from the coast. Assemble on the meadows in large flocks, like the rooks, in the spring and autumn. Very common in Finland, but I think do not breed in Denmark.

The carrion crow has hardly been properly identified in Scandinavia. Some naturalists (but I am not among the number) doubt whether the carrion crow is anything more than a local variety of the hooded crow.

Kjärbölling remarks that, in the south of Denmark—where the carrion crow is, I fancy, more common than the hooded crow—they assemble in the autumn in large flocks, as the hooded crows do in Sweden. This I never observed in England.

51. C. Frugilegus, L. Råka. The Rook. D. F.
Length 1 ft. 6 in. Plumage black, glossed with blue; base of the bill in the old bird bare, covered with a white scurf; body form much slenderer than in the crow, beak thinner, and feathers on the head and throat much more silky. None of the shafts of the

neck feathers are apparent. More gregarious in breeding and other habits than any other crow.

Is a summer migrant to this country, and rarely met with except in the extreme south; but I saw a pair (one of which I obtained) at Quickiock, and M. v. Wright mentions having received a specimen from Kittila, Lapmark.

52. C. MONEDULA, L. Käja. The Jackdaw. D. F.

Length 13 in. Crown of the head and upper parts of the body blueish black; occiput and nape, ash grey; iris white.

Is common in all the towns in the south and middle of the country; and if a great part of them migrate in the winter, a great many remain behind, especially in the south.

Gen. *Pica*, Cuv.

Tail very long and wedge-shaped. Other characters as in the crows.

53. PICA CAUDATA, Ray. Skata. The Magpie. D. F.

Length 18 in.; tail 9 in. Head, throat, back and breast black, with a blue and green gloss; shoulders, breast, and belly white.

Is universally dispersed over all Scandinavia, from the extreme south even up to Hammerfest, in West Finmark; remains throughout the year. I have repeatedly observed in Sweden, that, about Christmas, the magpies assemble around their old nests, as if to decide who was to take possession, and leave them till they begin building in March.

Gen. *Garrulus*, Briss.

Beak shorter than the head, which is covered with long bushy feathers; the whole plumage soft and bushy; tail rounded, longish.

54. GARRULUS GLANDARIUS, Briss. Nöt skrika. The Jay. D.F.

Length 14 in. Colour reddish brown-grey, with black tail; upper and under tail coverts white, and brilliant blue wing coverts, with small black transverse bands; iris grey-white. No difference in plumage of the sexes.

Is stationary in the country throughout the year. Although met with pretty far north, and throughout the whole of Finland, I never saw it myself in Lapland, but from what I heard, I have every reason to believe that it is occasionally met with there.

55. G. INFAUSTUS, L. Lafskrika. F.

Smaller and more slender than the last, which, however, it much resembles in form. Body colour, reddish-brown and grey, with a black-brown head; wing coverts, upper and under tail coverts, as well as the tail itself (with the exception of the two middle feathers, which are ash grey), rusty red.

Is far commoner in the extreme north of the country than the jay is in the south and midland districts. Its southern limit appears to be North Wermland, from whence it is met with far within the polar circle. It is a very bold, fearless bird. I never saw them higher on the fell sides than the limits of the pine forests.

The nest is built in April, while deep snow is on the ground, generally in a small fir, and in a conspicuous situation; large; formed outwardly of dead fir branches, and thickly lined with feathers. Egg a little smaller than that of the jay; ground colour pale blue-grey, mottled and dashed all over, especially at the large end, with darker grey and light brown. I fancy three eggs is the usual full number, like the crossbills, and, like these latter birds, the Siberian jay begins to sit as soon as one egg is laid. Excellently figured by Dr. Bree as the "Siberian jay."

Gen. *Caryocatactes*, Gesn.

Beak longer than the head; tail moderate; appear to form a kind of link between the jays and the woodpeckers.

56. CARYOCATACTES GUTTATUS, Nilss. Not kråka, Sw.; Nödde kraake, Norv.; Päh kina-hak kinen, Fin. The Nutcracker. D. F.

Length, 1 ft. 2 in. Body, colour brown, covered with white drop-formed spots. Wings and tail black.

That the nutcracker is a regular summer migrant to the middle and north of Scandinavia, I believe, although it appears in much greater numbers in some years than others. The bird is also well known in Lapland, and Finland, and yet strange to say, we very rarely see them, and never, I may say, except in the autumn, and the breeding habits of the bird appear to be involved in an impenetrable mystery. I believe no one yet has been able properly to authenticate the egg (certainly not in the north), and although I have had three full sets of eggs through my hands, which I have every possible reason to believe were the genuine eggs of this bird, yet as I did not take them myself, or see the old bird or the nest *in situ*, I could not authenticate them. In 1860, I procured two sets of eggs, all of which, but one, I sent to England, and one of these eggs was laid before the Zoological Society by Mr. A. Newton, who remarked that of the examples then exhibited by him, my egg was the one in which he was most inclined to believe. Both sets were taken in South Wermland, a little south of where I live. In both cases the nest was in a small fir, in one instance on a large island; the full number of eggs in each was four. I procured one of the nests, which was not unlike that of the common jay, but very different from Mr. Newton's description of the nest of the nutcracker, which he received in 1861, from the island of Bornholm, in the Baltic, with young birds. This latter nest was taken on the 30th May, and the young birds had left it perhaps eight days. My eggs were taken fresh in May, and the boy who took them, and in whom I can place confidence, described the bird as the nutcracker. Moreover, Dr. Hammagren of Carlstad, who, for some time, resided in Dalsland, a province south of this, and a very little way from where I received my eggs, says that in the north of that province, in a tract called Hassel Skog (on account of the number of nuts which grow there) the nutcracker is not uncommon in the summer. The egg which I saved for my own cabinet is scarcely so large as that of the jay, but thicker and blunter. Very glossy. Ground colour green, strewed

all over with dark ash brown irregular blotches of two shades, crowded together at the larger end. In one of the eggs I remember they formed a zone round the middle. Morris's amended figure gives a good general idea of the egg. It is, however, larger and much lighter coloured than my eggs. His figure is copied from Schinz. Baldamus describes a nest with five eggs, taken in Hungary, April 15,. 1846, in a fir about six feet from the ground. He says the nest was like that of the grey crow, but smaller, made of fine dry fir twigs, and lined with soft grass and hair, a little larger and deeper than most nests of the jay. My nest was principally built of dry birch twigs, and there was no hair in the lining. The description of his eggs pretty well agrees with mine, and I have read two other descriptions of the eggs in German books, which exactly agree with my eggs. It is very probable that dwarf eggs of the magpie, as well as of the Siberian jay, have been represented as the eggs of the nutcracker, but my eggs could not have been those of the latter, for it does not breed here, and it is very unlikely that they could have been the eggs of the magpie, for neither nests were domed, and every egg in both nests has the same character precisely. Till the egg is fairly authenticated, we must, I fancy, be fain to consider my eggs as genuine as any that have been hitherto produced. One thing, I think, we may take for granted, which is, that the nutcracker does not breed in the hole of a tree, as has been hitherto stated, nor lay a cream-coloured egg, for both Mr. Newton's and Professor Baldamus's evidence, as well as my own (if that is worth anything), speaks quite to the contrary.

Is said by Kjärbölling only to be seen in Denmark proper, during the period of migration from its more northerly home. Has been seen in Finland during the summer by M. v. Wright. I fancy Kjärbölling must have seen authentic nest and eggs.

Gen. Sturnus, L.

Beak conical, straight, differing from all the others or

the family in being depressed, not compressed, throughout. Tarsus longer than the middle toe. Wings long. Second feather longest. Tail short.

57. STURNUS VULGARIS, L. Stare. The Common Starling. D. F.

Length, about 8 in. Colour black, with purple, red, green, and blue metallic gloss above, and sometimes green below, bestrewed with small pale rusty yellow spots. Both sexes alike. Young, grey-brown, unspotted.

Is a summer migrant to this country, and is then met with in all parts up to within the Polar circle. Nilsson says it is not seen in Finmark. M. v. Wright, however, says that it is met with in great numbers in the south of that country, and even in smaller numbers near Uleaborg.

Gen. *Gracula*, Cuv.

Beak long, straight, conical; head crested; tail square.

58. GRACULA ROSEA, Cuv. Rosenfärgad Drossel. The Rose-coloured Pastor. D. F.

Length about 8 in.; body colour rose red; head, wings, and tail black; the crest on the head bent back over the neck.

Has only been occasionally killed in Scandinavia, and the examples have always been solitary. It has, however, according to Nilsson, been once killed in Lapland, and according to M. v. Wright, once near Abo, in Finland.

Gen. *Oriolus*, L.

Beak conical; legs short; wings long; third feather longest; tail long, square at the end; tarsus not longer than middle toe.

59. ORIOLUS GALBULA, L. Sommar Gylling. The Golden Oriole. D. F.

About the size of a blackbird; the under wing coverts, the point of the tail, and its under coverts, pale yellow. Male bright yellow, with a black band between the

beak and eye (which is red); wings and tail black; female and young olive green; below whitish, with small dark longitudinal spots.

Appears to be very rare and only accidental in Scandinavia and Denmark, whereas it is very common, and breeds in the eastern parts of middle and south Finland.

The nest and eggs of the golden oriole are, perhaps, the chastest of any; the latter about the size of those of the thrush, pure white, with deep red-brown spots.

Gen. *Coracias*, L.

Bill robust, straight, upper mandible bent at the tip; nostrils basal; gape edged with stiff hairs; toes entirely divided; wings long-pointed; second feather longest; tarsus shorter than the middle toe.

60. CORACIAS GARRULA, L. Blå Kråka. The Roller. D. F.

Length about 13 in.; whole body colour blue-green, with brown-red back, and black wings; iris brown-grey.

Is a summer migrant, and, according to Nilsson, not uncommon in many of the leafy woods in the middle and south of Sweden. I never, however, had the luck to meet with it. Appears to be rare, but breeds in Finland, and also in Denmark. Eggs round shiny white, laid in the hole of a tree.

Fam. 4.—SERICATI.

Gape wide; beak short and straight; plumage soft and silky.

Gen. *Bombycilla*, Briss.

A crest of feathers over the neck from the back of the head; bright red tips on the ends of the secondaries; beak broad at the root; gape wide; third wing feather longest.

61. BOMBYCILLA GARRULA, Veil. Sidensvans, Sw. Jouhi Lindu, Fin. Kukainen, Lap. The Bohemian Waxwing. D. F.

Length 8 in.; body colour ash grey, with a red-brown tinge, a pointed crest on the back of the head; wings

black, with white and yellow spots; tail with yellow tip, and red-brown under coverts; part of the secondaries with a red parchment-like tip on the end of the shaft; a band over the eye; the throat, the primaries, and the tail in front of the yellow tip, black; primaries at the tip on the outer side yellow, on the inner side white (in the male); the colours become deeper by age, and the red wing tips larger and more numerous; I have never seen more than seven; occasionally some small red tips appear on the ends of the tail feathers, but only in the very old males; iris dark brown-red.

The old female differs but little from the old male, except in the absence of the white edge tips on the inner fan of the primaries. These are, however, occasionally seen in very old females, but never so clear as in the old males, in which latter, the white spots on the secondaries are sometimes tinged with yellow. The black patch, however, on the chin in the female is never so large and deep, and in general the yellow colour on the outer fan of the primaries, as well as on the tip of the tail, is paler and more tinged with yellow ochre, and the red tips are fewer and smaller.

The young males (birds of the year) have only a smaller and lighter yellow patch on the outer fan of the primaries, no white on the inner fan, less yellow on the tail, and a shorter feather crest. In females of a like age there is seldom any yellow on the primaries, but the spots on the outer fan are white. The red tips are either very small or altogether wanting.

Description of a young bird of the year shot on September 13th, 1850, by M. v. Wright:—Length 8 in. It was very unlike the old bird. Head above the short crest, back of the neck, ear tracts, hinder part of the back, and upper tail coverts ash grey, with a yellow tinge; between the beak and the eye a black spot, as in the old bird; eye tracts pale grey; forehead white; a white band, with a faint yellow tinge under the black at the back of the eye; even under the eye a small white band, as in the old bird; throat whitish, unspotted, after that the colour is more rusty brown; sides

of the neck as well as the body darker grey-brown, with pale longitudinal streaks. The feathers here have pale grey ochre-yellow edges; middle of the breast and belly pale, nearly white, and unspotted; sides of the rump pale grey; tail beneath tinged with dull rusty brown; back and shoulders paler and more yellow-grey than in the adult bird. Wings and tail exactly as I have described above in the birds of the year; beak pale yellowish; head grey; legs light lead coloured; iris brown. The crop was filled with blackberries and the remains of insects.

The summer home of the waxwing, as far as we at present seem to know, appears to be within the Polar circle. I believe no nest has been as yet obtained farther south than the one I procured at Quickiock, although I have every reason to believe that they breed farther south, even as low as Östersund, in 63° north lat. About the end of autumn, probably early in November—but this depends upon the season,—large flocks travel down the country, clearing off all the mountain ash berries as they pass along, like a swarm of locusts. These migrations do not appear altogether to be regulated by the state of the weather, or the profusion of food. I have, however, remarked that their first appearance in Wermland preludes the first fall of snow. One thing, however, is certain, that of late years we have never seen such flocks of waxwings in the middle of Scandinavia as we used to do some few years back. In default of mountain ash berries they will eat the berries of the juniper, and on their return in the spring, which is usually early in April, I have observed them feeding on the young rye wherever it was bare. I fancy in their summer home they are chiefly insectivorous; in flight and habits they much resemble the starling. Their note, according to Nilsson, in the winter is low and melodious. I never (and I have had many in confinement) knew one utter any other sound than a kind of hissing twitter, which is principally heard when a flock sweeps down on to the top of a rowan tree.

The nest, which has now been obtained from many places in Lapland, is built apparently in the birch as well as in

the pine forests, at different distances from the ground, and the birds do not appear to breed in colonies. It is thick and clumsy in appearance; the walls of fine fir branches mixed with the moss *Usnea barbata*, leaves, and inwardly lined with dry grass, and sometimes feathers. The eggs, usually five, are thickly strewed with small black-brown spots, and dots, on a pale greenish white bottom colour. They are scarcely so long as those of the common bunting, but nearly as thick, and blunter and rounder.

The birds breed in June, and are very quiet during the breeding season, and the old female darts away from the nest when disturbed, betraying little of that anxiety which characterizes most other birds under the same circumstances; and as the Lapland forests have not till lately been much explored by oologists, there is little wonder that the breeding habits of this bird have so long remained a mystery. Still it does appear strange that out of all the Swedish naturalists who have visited Lapland, no one should have been able to give any good account of either nest or eggs, till Mr. Wolley untied the Gordian knot in 1856.

I may here add, that the Carolina waxwing, or cedar bird, which may be confounded with our European waxwing, has the belly of a pale yellow colour. The wings of both sexes are of a plain deep slate colour, without any *white or yellow markings*, and the female has never any red appendages to the secondaries.

Fam. 5.—Fissirostres.

Bill very short and broad; gape wide, extending beneath the eyes; feet weak.

NOCTURNAL.

Eyes very large; plumage soft.

Gen. *Caprimulgus*, L.

Bill short, flat, and broad; tarsi short; toes long and powerful; hind toe joined to the inner at the base; tail rounded with ten feathers; wings long; second feather longest.

62. CAPRIMULGUS EUROPÆUS, L. Natt Skärra. The Night Jar. D. F.

Length about 10 in.; tail 2 in. beyond the closed wings. Colour, above grey, spotted with longitudinal black spots and streaks; marked underneath with rusty yellow, and black-brown transverse bands. The female is like the male in colour, but entirely wants the large white spots on the inner fan of the wing feathers, and the white tip on the outer tail feather.

Is a summer migrant to Sweden, and although it seems to go pretty far up, is not met with in Lapland. The eggs, usually two, laid on the ground among heather, are oblong shiny white, marbled with brown and grey spots and dashes. Common in Finland as far up as Kupio.

DIURNAL.

Eyes moderate; plumage close.

Gen. *Cypselus*, Ill.

Wings long and curved, like scymitars. Second feather longest; tail cloven, ten feathers; tarsus very short; plumed to the toes, which are all in front.

63. CYPSELUS APUS, L. Torn Svala. The Swift. D. F.

Length 7 in.; wings 1¼ in. longer than the tail. Colour altogether black, with a greenish tint; throat white.

Met with everywhere, far up within the Polar circle. The Alpine swift has once been in the winter found dead in Lodderup church, in Denmark.

Gen. *Hirundo*, L.

Tail deeply cloven; the two side feathers considerably larger than the rest.

64. HIRUNDO RUSTICA, L. Ladu Svala. The Swallow. D. F.

Length about 7 in. Colour, above all black, with a blue gloss; forehead and throat red-brown; breast, belly, and under tail coverts whitish; tail feathers with a white spot on the inner fan.

More common than the last, and goes quite as high up.

Gen. *Chelidon*, Boie.

Tail moderate, not deeply cloven.

65. H. URBICA, L. Hus Svala. The Martin. D. F.

Length 5½ in. Colour, black above, with a blue gloss; upper tail coverts, breast, and belly, white; tail very little cloven; no spot on the feathers; legs feathered to the claws.

Equally common both in the south of Sweden and Lapland.

66. H. RIPARIA, L. Strand Svala. The Sand Martin. D. F.

All the upper parts, and a transverse band on the breast, brown. Legs and toes bare, not feathered.

Very common in many parts, but local. I did not observe them so common, however, in Lapland as the last.

Fam. 6.—DENTIROSTRES. SONG BIRDS.

Tip of the upper mandible slightly toothed and hooked; outer toe united to the middle one at the base.

Gen. *Muscicapa*, L.

Bill short, broad at the base, which is furnished with bristles; wings long and pointed; third and fourth feathers longest; hind toe long; tail even at the end; extends one half beyond the closed wings.

67. MUSCICAPA GRISOLA, L. Grå Flugsnappare. The Spotted Flycatcher. D. F.

Length 6 in.; upper parts brown ash; under parts white; head and breast dusky spotted. Second wing feather longer than fifth, first scarcely longer than nearest covert.

Has a wide range over Scandinavia, to far up within the Polar circle. *Eggs* greyish white, red-brown, spotted all over.

All the flycatchers are summer migrants to Scandinavia.

68. *M.* PARVA, *Bechst.* Liten Flugsnappare. D.

Length 4½ in. *Colour*, above brown, unspotted; below whitish without spots; on the breast shaded

with rusty grey; tail feathers blackish; the four outer ones on each side white over the middle. Second wing feather shorter than fifth; first much longer than the nearest wing covert.

This is figured in Dr. Bree's "Birds of Europe" as the red-breasted flycatcher, but his figure represents the bird with a far redder breast than I have ever seen. Is only accidental, and very rare in the North. Met with in South Russia although not in Finland. Egg resembles that of the last.

69. M. ATRICAPILLA, L. Svart och hvit Flugsnappare. The Pied Flycatcher. D. F.

Length 5¼ in. Colour, male black above, white underneath; female brown above, white grey underneath. A large white spot on the wing; second primary shorter than the fifth; the first a little longer than the nearest wing covert; first, fourth, and sixth of one colour; the second and third side feathers of the tail white towards the tip of the outer fan. The male has a white forehead, but no white collar.

Was formerly very rare in Scandinavia; now, however, it is met with in many places both in Sweden and Norway, but is, I fancy, local. I saw many up in Quickiock, Lapland, where, rather contrary to their habits in other parts, they nearly always frequented water, and bred in old willows.

Nest in a hollow tree or stone; eggs five, pale blue.

70. M. ALBICOLLIS, Tem. Hvithalsad Flugsnappare. D.

Very similar to the last in size and appearance. The second wing feather is, however, *longer* than the fifth; the second and third side feathers of the tail, white on the outer fan. The male has a plain white ring around the neck, and a white forehead.

The male is easily distinguished in the breeding season, but the males in winter plumage, the females, and young birds of both species, may easily be mistaken for each other.

Is rare in Scandinavia, but breeds on the Isle of Gotland. Accidental in Denmark. Nest in a hollow tree; five eggs, resembling the last.

Excellently figured by Dr. Bree as the "white collared flycatcher."

Gen. *Lanius*, L.

Bill strong, straight, hooked at the point; stiff bristles on the gape; nostrils covered with bristly feathers from the forehead; claws strong; tail long, more or less graduated.

This genus forms a very good transition from the falcons to the warblers, and should properly stand next to the *Rapaces*.

71. Lanius Excubitor, L. Storre Tornskata. The Ash-coloured Shrike. F. D.

Length 10 in.; tail 3½ in. beyond the closed wings. Colour pale ash blue above; below white; a black band through the eye; wings black, with two white spots on each; tail graduated, black: sides and tip white. First wing feather broad, reaching beyond the first wing spot, second primary much shorter than the third, which is longest. The females and young have the under parts finely watered with a darker colour.

Is local, and nowhere very common. I never met with the nest except in Lapland. Remains in the middle and south of the country, throughout the winter, but I never saw it in Wermland during the summer.

The nest, usually placed in a small fir, is one of the warmest and most comfortable I ever saw; built outwardly of dead fir branches, and lined with a very thick layer of feathers.

Eggs five; considerably larger than those of the red-backed shrike; greenish white, marbled with grey and brown.

They go to nest in Lapland early in May.

72. L. Minor, Gmel. Svartpannad Törnskata. D. F.

Length about 8 in.; colour above ash grey, underneath white, with a rosy tint on the sides and breast; a deep black band over the forehead, and through the eyes; wings black, with only one white spot; tail black, white on the sides; first wing feather small,

pointed, only reaches to the white wing spot; second primary scarcely shorter than the third: tail not so much graduated as in the last.

Is not nearly so destructive to small birds as the last, its principal food being insects.

The nest and eggs rather resemble those of the last. Both, however, are small, and the egg more bluish white, with the brown dashes always much larger.

Is only accidental either in Scandinavia, Denmark, or Finland, and never breeds here. Figured by Dr. Bree as the "lesser grey shrike."

73. L. Collurio, L. Brunryggad Törnskata. The Red-backed Shrike. D. F.

Length about 7 in.; back, red-brown, no spot on the wings; head, back of the neck, and rump in male ash blue, in female red-brown; under parts white in male, tinged with rose red, in female with light brown wavy lines.

Is a summer migrant to Scandinavia, and does not go up much above the middle of the country.

The woodchat is unknown in Scandinavia, but is met with in parts of Denmark.

Gen. *Saxicola*, Bechst.

Bill flat at the base; nostrils round in a groove; wings long, third and fourth quills longest; tail even, reaching about half of its length beyond the closed wings. Are all spring migrants to Scandinavia; build on or near the ground. Eggs six, of different shades of blue.

74. Saxicola Rubetra, Bechst. Busk sqvätta. The Whinchat. D. F.

Length 5 in.; colour above black, with rusty grey feather edges; a white stripe above the eye; a white spot on the wings; chin and sides of the throat white; throat and breast rusty brown; tail white at the root, then black. Sexes differ but little in plumage.

Is common everywhere in the summer from Scania to

within the Polar circle. I observed them high up on the Lapland fells, but not so high as the wheatear.

75. S. RUBICOLA, Bechst. Svart Lakad Busk sqvätta. The Stonechat. D.

Much resembles the last in size and appearance, but the throat is black; no white band over the eyes; tail feathers totally black-brown without white, and the first wing primary is much longer than the nearest wing covert.

Is quite accidental in both Scandinavia and Denmark, and not known in Finland.

76. S. ÆNANTHE, Bechst. Sten sqvätta. The Wheatear. D. F.

Length 6 in.; back grey; rump, forehead, and a streak over the eyes white; a black band through the eye; tail square at the end, white with a black tip. Female is more rusty grey, and in the autumn both the young and old birds are much alike.

Is one of the commonest birds throughout all Scandinavia in the summer, and goes far into Lapland and high up on the fells to the very snow region.

SYLVIIDÆ. WARBLERS.

Bill slender, with a few weak bristles at the base, compressed on the anterior half; nostrils basal, lateral, placed in a broad groove, and half covered with a membrane; tarsus longer than the middle toe; third and fourth wing feathers longest; outer toe united at base to middle; hind claw strong; tail in general long, rounded, or square.

The warblers form one of the largest divisions of our birds, and one which it is almost impossible to separate into genera. I think the arrangement which I have adopted is one of the simplest, although the strictly scientific naturalist may probably find fault with it. The warblers are all summer migrants to Scandinavia, leaving in the autumn, although

I have seen an occasional robin in the Wermland forests during the severest winter.

They are for the most part small, plain-coloured little birds, frequenting bushes, groves, plantations, and reeds, and all sing more or less well. In most species the female differs very little in plumage from the male.

SECTION 1.—*Sylvia*, Keys. and Blas. *Curruca*, Bechst.

TREE WARBLERS.

Beak small, as high at the root as it is broad; legs rather short, toes weak. Distinguished by their uniform dull grey colour, are very lively and all good singers. They build deep but thin nests, in bushes or small trees, and the eggs of all may be at once known by their grey-brown, shiny, mottled character, not spotted. Those of the black cap, are much larger than any of the others. Those of the garden warbler, and white throat, are often very much alike in size and markings. Those of the lesser white throat, much smaller than any. Number of eggs four to six. Frequent gardens, woods, and plantations.

77. SYLVIA ATRICAPILLA, Lath. Svarthufvad Sångare. The Blackcap. D. F.

Length 6 in.; colour ash grey above, with an olive green tinge; throat, breast, and sides pale ash grey; head in male black, in female brown; legs lead coloured. The first wing feather longer than the nearest covert, second much shorter than fourth.

Is sparingly distributed over this whole continent, from the extreme south at least, as far up as Tornea Lapland. I think it is the finest songster of all.

78. S. HORTENSIS, Bechst. Trädgård Sångare. The Garden Warbler. D. F.

Length 5¼ in.; first wing feather much shorter than the nearest covert; second longer than the fourth; third longest; colour above brown olive grey; breast and

sides pale grey, with a yellowish tinge; legs and beak lead coloured; whitish feathers on the edges of the eyelids; iris red-brown.

Is met with as far up at least as Quickiock, Lapland. Is more common everywhere than the last.

79. S. CINEREA, Lath. Grå Sångare. The White Throat. D. F.

About the size of the last; top of the head cinereous; back, and wing coverts, grey-brown; throat and belly pure white; breast pale rose red (which is wanting in the female); legs brown-yellow; iris nut brown; all the inner wing feathers, and the larger coverts are broadly edged with rusty yellow, and this will distinguish the bird at all seasons. First wing feather shorter than nearest covert, second like the fourth.

About as common as the last, but I do not think it goes so far north.

80. S. CURRUCA, Lath. Ärt Sångare. The Lesser White-throat. D. F.

Scarcely so large as the last, which it rather resembles, but the wings want the rusty, and the breast the rosy tinge; head and rump ash grey, under parts silvery white; shoulders ash grey; legs dark lead coloured. First wing feather longer than the nearest covert, second like sixth, third longest.

About as common and widely spread as the last.

81. S. NISORIA, Bechst. Bröstvattrad Sångare. D. F.

The largest of all the northern warblers. About 7 in. long; body colour above dark ash grey, white below with brown-grey wavy bars or streaks; tail feathers grey-brown, the two outer ones with a white spot on the point of the inner fan. The male becomes much darker after the breeding season. Legs grey; eye bright yellow. Excellently figured by Dr. Bree as the "barred warbler."

Confined to the south-east of Sweden. Rare in Denmark, where, however, it breeds. Has only once been observed in Finland.

The nest is large, placed in a bush, and the eggs, generally five (not larger than those of the black cap, although the bird appears considerably larger), are more spotted than blotched, with ash grey on a white ground. Dr. Bree's coloured figure gives a very good representation of the egg, but his spots are rather larger than I have generally seen them.

SECTION 2.—*Ficedula*, Bechst. *Lusciola*, Keys. and Blas.

BUSH WARBLERS.

Beak slender, broader than high at the root; tarsus longer than the middle toe, smooth in front; tail always more or less red-brown; eyes and feet large.

Frequent bushy tracts and thick-leaved plantations; build in banks, holes in stubs, between tree roots, generally or never, far from the ground. The nest is large, and the eggs, although they vary, are of one single uniform colour, except in the robin, which is white, often thickly spotted with red, so that the ground colour appears roddish. In this class the females differ in colour from the males, more than in any other, and the young at first are always spotted.

82. LUSCIOLA PHILOMELA, Keys. and Blas. Nordlig Näktergal. D. F.

Is very similar to the common nightingale, but rather larger, and the colours are duller. May, however, be distinguished at once by the difference of the wing feathers. The first is very small, pointed, and much shorter than the nearest wing covert; the second is like the third, and longer than the fourth. In the common nightingale, the first wing feather is equal to the nearest covert, and the second is like the fifth.

Is met with only in the south-eastern provinces of

Sweden, as far up as Gotland, but never on the eastern coast further than Scania, and is never seen in Norway. Is not rare in the south-east of Finland, where it goes up as far as Lipparvirti, in Kuopio Land. Is common also in Denmark. Its principal home appears to be the east of Europe.

Figured by Dr. Bree as the "thrush nightingale," but Morris, in his "British Birds," figures the *Sylvia turdoides*, Mey. (which belongs to the marsh warblers, and in Bree's "List of European Birds" is called the thrush-like warbler) as the "thrush warbler."

The *lusciola philomela*, Keys. and Blas. (thrush nightingale, Bree), is clearly a stranger to the British fauna.

Nest and eggs much resemble those of the common nightingale. Can nowhere be considered common in Sweden. Said to sing as finely as the common nightingale. I never had the luck to hear it.

The common nightingale (*L. Luscinia*, Keys. and Blas.) is not clearly identified in either Scandinavia or Finland, but is known in Denmark, where it is, however, not common.

83. L. Suecica, Keys. and Blas.; S. Cœrulecula, Pall. Blahäken. The Blue-throated Warbler. D. F.

It is the opinion of Dr. Bree that the Swedish blue-throated warbler, figured by him in his "Birds of Europe" (and to which, by the way, he should have given the name of the Scandinavian blue-throated warbler, for it is equally common during the summer in Norway, Lapland, and Finland), and which is characterized by having the spot on the blue throat, yellow-brown instead of white, is nothing more than a local variety of the British blue-throated warbler, whose native home appears to be the south of Europe. But before exactly agreeing with this opinion, which is also entertained by many other naturalists, I should certainly recommend a careful examination and comparison of many specimens, in both summer and winter plumage; and this, I fancy, has never yet been done. I do not know what is the

exact winter plumage of *our* Scandinavian blue-throated warbler, and this perhaps will be difficult to prove, because, unless it retains the yellow patch through the winter, it would be hard to distinguish it at that season from the British bird; but if it can be clearly proved that the northern bird retains the yellow patch through the winter, and that the southern form has a white throat patch at that season, I think that they should then be considered as two species. Moreover, I think that, upon a careful examination, some differences in structure will be found. I know nothing of the breeding habits of the white-throated bird, for it has never in a single instance been noticed in Scandinavia, nor does it appear that our Scandinavian form has ever been seen in England.

Description of our Swedish blue-throated warbler, from fresh-killed specimens:—Length 5¼ in. to 5¾ in; from carpus to tip of wing 3 in.; tail 2 in.; beak 4½ l.; from gape 6 l.; tarsus 1 in. 1 l.; middle toe 7 l.; hind toe 4½ l. (Sw. measure). First wing feather much longer than the nearest wing covert; second a very little shorter, or equal to the sixth; third longest. Colour, above dark olive-grey; brown throat; in the male bright blue, with a reddish yellow spot in the middle; in the female white, with a black border; the inner half of the tail red-brown, the outer half black, but the two middle feathers are wholly brown; iris brown; legs dark yellowish grey.

The young birds in the first dress, have the breast and sides rusty grey, with confused spots. The old males in the autumn have the throat whitish rusty yellow, edged with black; sides of throat blue above, then a yellowish red spot; below that a transverse blue streak, below which are some black spots; and the rest of the breast is rusty red. The lower figure in Dr. Bree's plate is the female—the upper one the male. They are in breeding plumage.

Is never seen in the middle or south of Scandinavia, except just in the periods of migration, for they all appear to go up to the northern fell tracts to breed, and their southernmost summer range appears to be between 62° and 63° north

lat. I have twice killed the bird in Wermland while migrating, and both times in high grass by the river side; but the principal migration does not take place through Sweden, for it is supposed that the Norwegian birds pass over by the way of Jutland, and the Swedish birds through Finland.

The song of the blue-throated warbler is very clear, high, and so varied, that among the Laps it goes by the name of "Saddan Kiellinen," or hundred tongues. It is clearly an aquatic warbler in its habits, for I never met with it in Lapland in the breeding season except in the fell meadows, in bushes, by the side of small running streams, although, after the young could fly, the old birds sometimes would take them up, on to the higher fells, but never very high.

The nest always on, or in the ground, often quite bare, formed altogether of dry grass; cup-shaped. Eggs six; pale blueish green, minutely spotted with rusty red, giving the eggs a rusty appearance.

84. L. RUBECULA, Keys. and Blas. Rödbrösta. The Redbreast. D. F.

Length 5¼ in. Upper part dark olive green, or grey-brown; wings and tail dark brown, with rusty brown edges; throat and breast red.

Although a spring migrant to Scandinavia, some remain here throughout the winter, and those which do migrate leave the latest, and return perhaps the earliest, of any other migrant. During the summer they are met with generally throughout the country, almost as far up as within the polar circle. Unlike the British robin, they seldom approach the dwellings of man here—at least in the middle of the country—but are usually seen in the deep forests. I never met with the robin in Lapland.

85. L. PHŒNICURUS, Keys. and Blas. Rödstjert. The Redstart. D. F.

About the size of the redbreast, but more slender. Tail and rump rusty red; the middle feathers brown; the male,

throat black; breast rusty red; forehead white; back ash grey; the female above brown-grey; throat whitish; breast reddish brown; second wing feather like sixth; third a little shorter than fourth, which is longest.

Is met with in the summer, dispersed over all Scandinavia, from Scania up to Enare, Lapland, 70° north lat., and next to the willow warbler, is the commonest of all the warblers, both in Scandinavia as well as Finland.

86. L. Tithys, Keys. and Blas. Svart Rödstjert. Tithys' Redstart. D.

About the size of the last, but may at once be distinguished by the darker colour of the whole body, the different proportionate length of the wing feathers, and the total absence of all red on the body, except the tail. Tail as in the last, but scarcely so bright; in the male throat and breast black; head, neck and back ash blue; no white on the forehead as in the last; in the female body colour above dark; below paler ash grey; second wing feather like the seventh; third, fourth, and fifth nearly equal, and longest.

Is only accidental in the North; only three examples are recorded as killed in Sweden, and none in Norway. The first at Upsala many years since; the second, a female, was shot by myself in the spring of 1851, near Kullen, in Scania; and the third, a young male, was taken in autumn at Stockholm by Conservator Memes. Accidental in Denmark, and not known in Finland. Unlike the last, the eggs of which are light blue, the eggs of this species are pure white.

Section 3.—*Ficedula*, Keys. and Blas.

PLANTATION WARBLERS.

Beak thin and small, more broad than high at the root; legs thin and weak; wings longer than in the tree warblers, reaching beyond half the tail, which is indented; the outermost or second feather longest. May be known by their

olive green or yellow colour. Are principally found in leafy plantations, and all, with the exception of the first, build a thin cup-shaped nest on the ground, under a bush or tree root. Eggs all distinctly and minutely spotted with red or reddish brown, generally on a clear white ground.

A.—*Hippolais*, Bp.

Beak very broad at the root, and depressed throughout the whole length; legs with from four to five notches.

87. FICEDULA HIPPOLAIS, Keys. and Blas. Bastard Nakter-gal. The Melodious Willow Warbler. D. F.

Length about 5 in. Colour, greenish grey above; all the under parts, from the chin to the tail, bright yellow; secondaries and side tail feathers with white grey edges; legs lead grey. First wing feather shorter than the coverts; second shorter than fourth, longer than fifth; third longest; tail square, brown. The female scarcely differs in plumage from the male.

Certainly the finest warbler of this class in Scandinavia, and is dispersed throughout the summer (but sparingly) over the whole of the south and middle of the country, at least as far up as Wermland; in Norway, north of Trondtheim; in Finland, as far up as Kupio Land. Is seldom met with in fir woods, only in such plantations where birch and leafy trees are mixed with bushes.

Of all the warblers, I think this builds the sweetest little nest, and lays the handsomest eggs. I have generally found the nest in June, in a small tree, perhaps four feet from the ground, placed in a cleft between the branches; formed of dry grass and leaves, ornamented outwardly with the white outer bark of the birch, and inwardly lined with horse hair. Eggs generally five, larger than those of the wood warbler, rose-red, thinly bestrewed, especially towards the larger end, with round purple-black spots and streaks.

There is a great resemblance between this warbler and a continental species, "Viellot's willow warbler," *S. Hippolais* (Tem.), *Ficedula icterina* (Keys. and Blas.); and Dr.

Bree observes—"We have the two birds the same size, colour, and form, but they may be distinguished by the following characters:—In *Sylvia hippolais* (the Scandinavian bird) the wing in repose does not reach half way to the tail, and the first primary is equal, or nearly equal, to the fifth; in *S. icterina* the wing is always longer by two-fifths of an inch or more, than that of *S. hippolais*, and it consequently reaches beyond the middle of the tail, and the first primary is equal in length to the third; and these distinctions are constant both in male and female."

Whatever confusion has existed in the synonymes of these two birds, "and this has not been slight," it seems clear that the Swedish "Bastard Naktergal" is the true *Motacilla hippolais* of Linnæus.

B.—*Phyllopneuste*, Mey.

Beak outwardly compressed, thin. Legs slender, with few notches.

88. F. Sibilatrix, Keys. and Blas. Grön Sångare. The Wood Warbler. D. F.

Length, 4½ in. Upper parts, bright yellow-green, with a yellow streak over, and a dark one through the eye. Front of the neck and sides of the head yellow. Breast, belly, and under tail coverts, white; rump, light green. First wing feather shorter than the covert, second a little shorter than fourth, third longest. Legs brown. The outer tail feathers rather the longest.

Is tolerably common throughout the whole of the middle and south of Scandinavia; certainly as far up as Stockholm, but does not appear to go nearly so far north as the next.

89. F. Trochilus, Keys. and Blas. Löf Sångare. The Willow Warbler. D. F.

About the size of the last, which it rather resembles. Colour above, pale olive green, tinged with yellow; under tail coverts yellow. Legs yellow-brown. Front of the neck and breast yellowish. The paler coloured

legs, longer wings, and purer yellow colour distinguishes this from the last. The first wing feather longer than the nearest covert; second shorter than fifth, longer than sixth.

Is much commoner in Scandinavia than the last, and is met with throughout the country, from Scania up to the North Cape.

90. F. ABIETINA, Nilss. Grän Sångare. The Chiff Chaff. D. F.

Rather smaller than the last. Upper parts grey-brown, tinged with olive green; under, yellowish white. First wing feather much longer than the nearest covert; second much shorter than fifth, shorter than sixth, equal to the seventh. Legs dark brown.

Is met with in many of the fir forests in the middle of the country, but nowhere so common as the last; nor does it appear to go so far north, although I shot one example at Quickiock.

The Dartford warbler is unknown in the north.

SECTION 4.—*Calamoherpe*, Boie.

MARSH WARBLERS.

Forehead flat, beak strong, broad at the root; a few bristles at the gape. Wings short, rounded. Feet and claws large. Tail long, rounded. Colour, generally brown-grey; in some tinged with olive green.

Are always met with among bushes, reeds, and grass, in the neighbourhood of water. Some of them build a hanging nest. The eggs are generally more mottled than spotted.

91. CALAMOHERPE PHRAGMITIS, Boie. Säf Sångare. The Sedge Warbler. D. F.

Length, 5¼ in. Upper plumage olive brown. Spotted on the back and shoulders with brown. Upper parts rusty brown, unspotted; rump yellow. A broad, streak over the eyes, and the under parts yellowish

white. Secondaries with broad pale grey edges. First wing feather shorter than the wing covert; second and third alike, and longest. Tail 1¼ in. long, broad and rounded. Iris red-brown. Legs flesh-coloured grey.

Is partially distributed over the whole of the country, as far at least as Stockholm. Supposed to be met with in the north of Lapland, but this I believe, is by no means well authenticated. Is the only one of the marsh warblers met with in Finland.

92. C. ARUNDINACEA, Boie. Rör Sångare. The Reed Warbler. D.

About the size of the last, but may always be distinguished by the lighter coloured, unspotted body, and longer tail, 2 in. Second wing feather like the fourth; third a little longer, and longest.

Is much rarer than the last in Scandinavia, and I fancy confined to the south of the country. I have shot it near Gothenburg.

The nests of the reed warblers which I have taken, have invariably been cup-shaped, suspended a foot or so above the water's edge, fastened between upright reeds growing in the water. Eggs whitish, mottled green. I never myself took the nest of the *sedge* warbler in such a situation. The latter nest is always built with much less care, placed often on or close to the ground, by the side of the river, among sedge and high grass, and the eggs have the appearance of being marbled with pale brown, often rather resembling those of the yellow wagtail, but darker. As in England, I fancy this bird is local, but they both frequent the same tracts.

93. C. PALUSTRIS, Bechst. Kärr Sångare. D.

In size, colour, and appearance, much resembles the reed warbler, but the rusty yellow tinge on the sides of the body, the light blue legs, and the orange-yellow (not orange-red) gape, are all good marks of distinc-

tion. Moreover the wing is proportionably longer, and the second wing feather is considerably longer than the fourth, nearly even with the third, which is longest.

The breeding habits of this "marsh warbler" more resemble those of the sedge warbler, although the egg is more like that of the reed warbler, but not so green.

Is said to be the finest songster of all the water warblers. It does not frequent the same localities as either of the two last, but in Sweden is generally found in the vicinity of water, among low bushes or nettles, corn, high grass, etc., and in the summer most among green rye or peas. Is seldom seen, but the song, which is so unlike that of either of the last, cannot fail to strike the ear at once.

It is met with in the south and south-west of Scania and also in Denmark, but, as Kjärbölling observes, it has so long been confounded with the last, that it is hard to define its proper limits or localities.

The aquatic warbler (*Sylvia aquatica,* Tem.), the grasshopper warbler (*S. locustella,* Boie), the great sedge warbler, or thrush warbler (*S. turdoides,* Mey), and the *S. cariceti,* Naum, or *Striata,* Brehm., are included in the Danish fauna, but none of them have been identified either in Sweden, Norway, or Finland.

I fancy this *S. Cariceti* must be either the *Sylvia aquatica,* or a variety of the *S. phragmitis* (sedge warbler), both of which it very much resembles. I do not find it figured in Bree's "Birds of Europe," or mentioned in his list as a species, but in his list of synonymes to the aquatic warbler he gives, *Calamodyta Schœnobœnus et Cariceti,* Bp., 1838; Gerbe; Dict, 1848; so he probably considers it as the same bird.

Kjärbölling gives it the Danish name of star sängare, and describes it—Pale yellow-grey, black spotted. Rump rusty red. A yellow-white stripe over the eye. Forehead black, with a yellow-grey stripe in the middle. Wing feathers edged with pale grey. Under parts yellowish white, with many fine blackish streaks on the front of the

breast and sides; and he adds: "It differs from the *S. Schœnobœnus* in the smaller size of the five streaks on the head, and from *S. aquatica* by the longer beak, the shorter tarsi, the shorter wings, the colour of the back, and the sharper, dark streaks on the sides and breast."

Nilsson notices two other warblers, both new species. The first is the *Sylvia magnirostris* (Lilljeborg), which seems to differ only from *C. palustris* in the second wing feather being a trifle shorter than the fourth, and the wings being a little shorter. As to the size of the beak, from whence it appears to derive its name, Nilsson remarks that in size and form, the beak is precisely the same as in the Jutland specimens of *palustris* which he has received from Kjärbölling.

The second is the *S. calamoherpe media*, Malm., which seems to differ from *S. turdoides* only in the size and relative proportion of the wing feathers. The first of these appears to have been discovered by Lilljeborg, in Russia, and the last was described by Malm from a specimen shot near Gothenburg in 1849.

Nilsson does not appear to consider them good species, and as neither of them are noticed by Dr. Bree in his "List of European Warblers," I think we may fairly conclude, that their claim to be regarded as such is at present more than doubtful. If such trifling differences as these show, will form a species, there is hardly a collector who will not be able to gain a handle to his name. Savi's warbler is not known in the north.

Gen. *Turdus*, L.

On account of the shape of the bill, approach near to the crows. In all, during the breeding season, the ring round the eye and the gape are yellow; bill strong, sides compressed, curved at the tip, which is bent over and toothed; wings long; gape bristly; tarsus longer than middle toe; legs and feet strong and large; third or fourth wing feather longest. All, with the exception of the dipper, are summer migrants to Scandinavia, although in a mild winter some few remain in the south of the country.

94. TURDUS VISCIVORUS, L. Dubbel Trast. The Missel Thrush. D. F.

The largest of the northern thrushes, about 1 ft. long; colour above, light olive grey, below white, with black pointed spots on the neck, oval on the breast; under wing coverts, and the inner tips of the three outer tail feathers white; tail grey-brown.

Is met with generally throughout the country, and I have taken the nest in Quickiock, Lapland, but it does not go much farther north, for there the nest was considered a rarity, as well as that of the common thrush. The boy who brought them to me considered them worth as much as that of the pine grosbeak.

95. T. VARIUS, Pall. Månfläckig Trast. White's Thrush.

Nearly the size of the last; yellow brown-grey above, below white; each feather on the upper and under parts of the body edged broadly with black, in the form of a half moon; tail consisting of fourteen feathers; second wing-feather like the fourth; third the longest.

The native home of this species, according to Pallas, is the rocky mountains of South Siberia, and also Japan. It has been killed twice in England, and once in Jemtland, in Sweden.

Another form, or it may be a closely allied species, the *Turdus lunulatus*, L., which is also said to have been shot in England, is a native of Australia. I cannot for certain say whether or not we had both forms in Australia, but a specimen of our common mountain thrush of Australia, as well as its egg, taken by me in Victoria, in 1855, now lies before me. My Australian bird exactly agrees with Nilsson's description, as far as the size and relative length of the wing-feathers. "Considerably smaller than the missel thrush, but larger than the common thrush. Length 9 in. 5 l.; tail consisting of twelve feathers; second wing feather equal to the sixth; third, fourth, and fifth nearly alike, but fourth a little the longest (of course I conclude that he reckons the first very small pointed wing feather as one), from carpal joint 5 in. 2 l.

(in the Japan bird he gives this as 6 in. 4 l.). I question whether there can be such an extraordinary difference in the length of the wings of two birds of very much the same size, for in my Australian specimen this portion of the wing, and I have very accurately measured it, scarcely exceeds 5 in. English in length. His description of the colouring is as correct as can be expected from a general description. I cannot help fancying, however, that Nilsson's descriptions of the measurement of *Turdus varius* are correct, because they are taken, doubtless, from the Jemtland specimen shot in 1837.

Although we called our Australian bird the mountain thrush, they always bred in our districts, far from the mountains in the tea-tree scrub, near water, and they seemed to come down to breed. The nest, placed some length from the ground, resembled that of the common blackbird; the eggs, three, considerably larger than any of the missel thrush, which I have seen, were fully as large and even thicker than those of the jay; light ground, covered all over with such minute pale red speckles that the whole egg has a rusty red appearance.

Morris's figure of the egg of White's thrush, pale light blue, with a few black scrolls on the larger end, does not certainly represent the egg of the Australian bird, and if it is a correct figure of the egg of the Japan bird, there is little doubt that they are two distinct species.

The mountain thrush in Australia was very shy and solitary in its habits; we never saw more than two together; they were generally on the ground, very hard to rise, and I never heard one utter a single note. I generally took the nest in August, which is very early in the Australian spring.

96. T. Musicus, L. Säng Trast. The Song Thrush. D. F.

Length 9 in.; olive brown above; the lower wing coverts edged with red-yellow; breast, sides, and belly covered with oval blackish brown spots; throat unspotted.

Common throughout the whole country during the sum-

mer, and I took the nest up at Quickiock. It certainly, however, is nowhere so common in the north as the fieldfare or redwing, nor does it go so far up. Like all the rest, occasional specimens may remain in the middle and south of this country, throughout the winter.

97. T. Iliacus, L. Rodvinge Trast. The Redwing. D. F.
Length about 8 in. 2 l.; colour above olive-brown; the under wing coverts, and flanks deep orange red; a broad white streak over the eyes; front of the neck covered with blackish, breast and sides with grey-brown, long spots.

Is universally dispersed throughout the breeding season from the south of Wermland, where I have taken the nest, up to the North Cape. Nest smaller and more neatly built than that of the fieldfare, and the eggs, five or six, are always smaller, neater, and purer in colour than those of that bird. It has, when fresh, a peculiar green tinge, which, however, fades soon after the egg is blown. You rarely see an egg spotted like that of the fieldfare; they are usually of a uniform green colour, which soon fades to green-brown.

98. T. Pilaris, L. Björk Trast. The Fieldfare. D. F.
Length nearly 10 in.; lore black; head and rump, ash grey; back, dark chestnut brown; under wing coverts white; tail black; abdomen unspotted.

Is as common, and in many places much commoner, than the last, in the north of Scandinavia, during the nesting season; and although on one occasion I met with them breeding in Wester Gotland, and even, according to Nilsson, they breed on Gotland, it is certain that their true summer home is in the pine forests of the far north. But they certainly nest in North Wermland and Dalecarlia. They are more gregarious in their breeding habits than the redwing, but I never saw them like rooks at home in a clump of trees, with many nests on one tree. Wherever you find one nest, you are, however, sure that more are in the neighbourhood; and in the Quickiock forests the redwing breeds in the

same manner, and, in fact, in company with the fieldfare. In Wermland, however, where they breed very sparingly, I have always met with this redwing, breeding solitary in a low bushy fir.

I think no thrush's egg is subject to so much variation as that of the fieldfare, and it would be almost impossible to describe it better, than that it much resembles the egg of the blackbird, but is usually a very little larger and deeper coloured.

99. T. TORQUATUS. Ring Trast. The Ring Ouzel. D. F.
Length 11 in.; plumage black, edged with grey; a large half-moon formed spot on the breast, white in the male, rusty-grey in the female.

Although very sparingly dispersed everywhere, the ring ouzel has the widest range of any Scandinavian thrush, for it is met with breeding in Bohus Land, and also right up near Waranger Fjord, close to the North Cape. Nest sometimes on the ground or else on a small tree, always near mountains or rocks. The egg resembles that of the fieldfare, but is larger, with a bolder character, and I always fancied it a little longer.

100. T. MERULA, L. Kol Trast. The Blackbird. D. F.
A little smaller than the last. The male glossy black, with yellow beak, and edges to the eyes; iris and legs brown; the female and young, black-brown, with white-grey throat, and indistinct dark spots in front of the breast.

Is not very common, but breeds everywhere as far up as Lyksell, Lapland. I have seen occasional specimens in South Wermland during the winter.

Gen. *Cinclus*, Bechst.

Beak thin and straight; head small; tail short; wings short; body short and plump; frequents running streams; can swim and dive, and also sings.

101. CINCLUS AQUATICUS, Bechst. Ström Stare. The Water Ouzel. D. F.

Length 7½ in.; tail only 2 in.; general colour blackish, with a white throat and breast. Female differs little from the male in colour, but is smaller.

Remains in Scandinavia throughout the year; does not appear to breed in the south, but bred near us in South Wermland, and I found the nest up at Quickiock; eggs six, white; nest sometimes covered.

Gen. *Motacilla*, L.

Tail very long and square; beak straight and thin; second, third, and fourth wing-feathers alike and longest; one of the secondaries (the seventeenth wing feather) as long or longer than the rest of the wing. Colour always variegated—yellow, white, black, green, blue, etc., never lark grey. Are all summer migrants to Scandinavia; all build on the ground; nest of grass and horse-hair; eggs six.

A.

Hind claw not longer than the toe, much bent; tail as long as the rest of the body.

102. MOTACILLA ALBA, L. Ring Ärla. The Continental White Wagtail. D. F.

Length 7½ in.; tail 2 in. beyond the closed wings; back *ash grey*; rump black-grey; forehead white; crown of the head, neck, and upper part of the breast *black*, under parts white. The external web of the two outer tail feathers white; wing coverts with broad white edges.

The females are always lighter in colour, and sometimes the black on the head is altogether wanting, and all the upper parts are ash grey.

This is the breeding plumage in which alone the wagtails are met with in Scandinavia. In the winter the black is all changed to grey, except a shield over the breast.

Is very common throughout the country, up to the North Cape.

Nilsson considers the pied wagtail (*M. yarelli*, Gould.), which is the common wagtail in Britain, and is distinguished from the *M. alba*, L. (which is the common wagtail on the

continent), by its black being pure like that of the head, as nothing more than a local race of the *M. alba*, L. This has, I believe, been occasionally killed in Sweden and in Denmark; described by Kjärbölling, and one of the synonymes he uses is *M. lugubris*, Tem., which, however, is described by Dr. Bree as quite a different species, "the sombre wagtail." This latter may, however, at once be distinguished from any variety of *M. alba* by the wing primaries, more than half of the upper portion of which are pure white, while a white fringe, broader in summer than in winter, runs along the outer edge of the secondaries. The middle wing coverts are also pure white.

103. M. BOARULA, Lath. Grå Ärla. The Grey Wagtail. D.
Length 8 in.; rump yellow, tail longer than in any other wagtail; the outer feather white, the two following white, with black on the outer fans; head greenish; back ash grey; under parts yellow, throat in the male black. In the female rarely pure black.

This is the breeding plumage, and in the winter the male assumes much the summer plumage of the female.

Has been shot only once in the south of Sweden, and is very rare in Denmark.

B.—(*Budytes*, of Authors.)

Second hind claw longer than the toe, and but little bent; tail shorter than the rest of the body.

104. M. FLAVA, L. Gul Ärla. The Grey-headed Wagtail. D. F.
This is the common Scandinavian yellow wagtail. Rather smaller than *M. alba*; back olive green; head ash grey, black, or green; tail black, the two outer feathers white on the outer edges; under parts yellow. The colours in the female are not so pure.

Common everywhere up to the North Cape; but I never saw any other than the black-headed form, *M. flava melanocephala*, Bp., in Lapland.

I do not think our British yellow wagtail, *M. Rayii*, Bp.,

in which the head and neck are yellow-green like the back, has yet been observed in Scandinavia.

In describing this *M. melanocephala*, Bp., in his "Birds of Europe," under the name of "the black-headed yellow wagtail," Dr. Bree observes: "Mr. Tristram has informed me that he has seen every gradation of colour from *M. flaveola* (the British yellow wagtail), up to the *M. melanocephala*, and has sent me specimens which bear out the opinion of Temminck, that its claims to be considered a good species are doubtful." In fact, he observes, it is very probable that all the European yellow wagtails are permanent varieties or races of the same type.

So Nilsson appears to think, for in describing this *M. flava*, L.—which, of course, as being the common Scandinavian form he considers the type—he mentions *M. melanocephala* as a northerly, and *M. Rayii* as a westerly, form of that species.

I can only say that in Scandinavia I could never see any transitions in colour from our *M. flava*, to that of *M. melanocephala*. The difference in colour of the head is apparent at a glance, and I have examined scores of specimens. I have occasionally seen *M. melanocephala* with a white streak over the eye, but the head is always deep black. It is the only yellow wagtail I ever met with in Lapland. I never saw the grey-headed yellow wagtail there, nor have I clearly identified the black-headed bird breeding with us in Wermland, although we see lots in the spring. Strange that Wright does not mention this black-headed form in his Finland fauna, but he says that the grey-headed yellow wagtail is common in summer throughout the whole country. I always fancied that the call-note of the black-headed bird was much sharper than that of the grey-headed. The breeding localities, nest, and eggs of both are alike.

This form is not mentioned by Kjärbölling in his "Birds of Denmark," but he describes a third form unknown in Scandinavia, which appears to be not so very uncommon in parts of Denmark, and this is the *M. flava cinereocapilla*, Savi, which Dr. Bree figures as the "grey-headed yellow

wagtail," and in this the head is dark lead grey, with no stripe over the eye.

It is extremely difficult to decide whether these birds should be all taken as separate species, or only varieties in colour of one form; and I shall close my account of the wagtails with the following very sensible quotation from Dr. Bree's work, which I strongly recommend to the perusal of the modern school of species-mongers. He says: "As Dr. Zander has well remarked, we find the two ends of the series of varieties, and constitute them species. The intermediate forms do not come under our observation so frequently, and we therefore lose the significance of the serial affinities. Believing as I do, that much of the system of determining species in natural history in modern days is deficient in sound scientific principle, I have no occasion to seek for a solution of the difficulty in the theory of transmutation. I think that differences of climate and food are all sufficient to produce a great majority of the variations we meet with, and as it is more than probable that the world contains a vast number of special causes wherein these influences of food and climate operate distinctly, I have no difficulty in accounting for the variation of species, or of satisfying myself that the difference of a feather here or there, is not sufficient to justify the splitting up of our naturally defined genera and families, into an interminable long list of Greek derivatives, quite sufficient to frighten away nine-tenths of the students of nature, from the most beautiful and instructive of all pursuits."

Gen. *Anthus*, Bechst.

Colour lark grey, tail shorter than in the wagtails, of twelve feathers indented. Form a very good transition from the wagtails to the larks, which latter genus they resemble, but differ in the more slender build of body, the longer tail, the more crooked hind claw, the more pointed head, and the uncovered nostrils.

Like the latter birds they build on the ground, and lay about five dark-coloured eggs, either mottled or spotted. Are

all, except the rock pipit, summer migrants to the north or accidental visitors.

(*a*). Hind claw shorter than the toe.

105. ANTHUS ARBOREUS, Bechst. Träd Piplärka. The Tree Pipit. D. F.

Length about 6 in.; colour above olive green, with dusky spots; breast and sides spotted ochre yellow; wings with two transverse bars of yellowish white.

Common during the summer as far up as Enare, Lapland.

(*b*). Hind claw longer than the toe.

106. A. RICARDI, Veill. Richard's Pipit.

Length 7 in.; upper plumage deep brown, under parts rusty yellow, with black spots on the breast and sides; a broad rusty streak over the eye; hind toe 1 in., of which the claw is 5 l.; resembles the lark more than any other pipit.

The only specimen that was ever taken in Scandinavia was in 1856, when a young female was captured on a steamer lying during a fog in Calmar Harbour.

Not known either in Finland or Denmark.

107. A. CAMPESTRIS, Bechst. Fjäll Piplärka. D. F.

Long 7 in.; hind toe 5 l., of which the claw is 2½; rusty grey above, with pale brown spots; underneath yellowish, with small brown streaks on the breast and sides of the throat; a white streak over the eye; the two outer tail feathers, white on the outer fan. Iris brown; legs pale flesh.

Is very common on all the sandy plains and landbanks on the coast of the south of Sweden, but never in Norway. Flies in jerks, uttering a loud cry—"zirrly-zirrly-hvit." Nests in a tussock of rough grass. Eggs four to six, very pretty when fresh. Blue-white, with violet and red-brown spots and streaks. Common in Denmark. Has only once been killed in Finland.

Excellently figured by Dr. Bree as the "tawny pipit."

108. A. RUPESTRIS, Nilss. Skär Piplärka. D. F.

Length near 7 in.; tarsus 7 l.; hind toe 6 l., of which the claw is 3; colour above dark ash grey, with dark brown spots, especially on the back; below whitish, with a rusty yellow tinge on the breast and belly, and grey-brown spots; only the outermost tail-feather with a whitish edge; legs dark.

This is certainly the common rock pipit of Sweden, and is met with up to the North Cape. Can always be distinguished from the British rock pipit, *anthus aquaticus*, Tem., thus: the spots on the breast of *aquaticus* are large, and occupy one-half of the ground colour of the breast, while in *rupestris* they are more distinct, and very small, not occupying more than one-fourth of the ground colour; and, moreover, the ground plumage of *rupestris* is considerably richer. There is also a pale spot on the auriculars of *rupestris* not in *aquaticus*. Although a summer migrant, I have shot specimens off the southern coast throughout the whole winter. Habits like the common rock pipit, and the eggs are also much alike. Figured by Bree as "the water pipit."

The common rock pipit, *A. aquaticus*, Bechst, is not included in the Swedish fauna. I have, however, shot more than one specimen of this bird off the coast of Scania, and it is well known in Denmark.

The Pennsylvanian pipit, which has recently been added to the British fauna, has probably been overlooked in Sweden, and I will, therefore, quote the following remarks from Dr. Bree:—"When placed beside *A. pratensis*, there is a general resemblance between the two birds in size, colour, and markings. It differs, however, from *anthus pratensis* in the following points: the wing is half an inch longer; the hind claw shorter and more curved; the beak stouter and broader at the base. Plumage of the back is more uniform, olive grey, and less mottled, and on the lower part of the body there is a rufous tint more or less pronounced."

109. A. PRATENSIS, Bechst. Äng Piplärka. The Meadow Pipit. D. F.

Length 6 in.; back toe 5½ l., of which the claw is 3½.; colour above olive green, with dusky spots; neck, breast, and sides with a yellow tinge, spotted; beak small, thin.

As common as the last, and appears to go as far north.

Respecting the *anthus cervinus*, Pall., which Dr. Bree considers a distinct species, and has figured under the name of the "red-throated pipit," Nilsson observes: "In everything else, except the rusty yellow throat and breast, it exactly resembles the meadow pipit, and is clearly nothing more than a local variety or race of this bird." But Bree observes very properly; "It belongs to the rock pipit branch of the family, the claw being very much curved; and if it is a local variety, or race of anything, it must be of the *rock* and not of the *meadow pipit*."

Gen. *Accentor*, Bechst.

Beak straight; awl-shaped nostrils, pierced in a large membrane, naked; tarsi strong; tail long, square; third and fourth wing feathers longest.

110. ACCENTOR MODULARIS, Cuv. Jern Sparf. The Hedge Sparrow. D. F.

Length 6 in.; back rusty brown, with black spots; head, neck, and breast ash blue, with brown spots on the head.

Is a summer migrant, and goes far up into Lapland, but is no where very common, and, unlike the sociable little bird in England, they do not here seem to seek the companionship of man, but confine themselves to the deep woods.

Gen. *Troglodytes*, Veill.

Beak long, very thin; wings round; third and fourth feathers longest; tail short, weak, carried upright.

111. TROGLODYTES EUROPÆUS, Leach. Gärd Smyg. The Wren. D. F.

Length 4 in.; tail 2 in.; back, wings and tail rusty

brown, with black wavy lines, which are very conspicuous on the wing and tail feathers.

Met with in summer throughout the whole country, from Scania to Lapland. Winters in the south and middle of the country.

Fam. 7.—Conirostres. Hard-billed Birds.

Beak strong and conical; wings moderate; tarsi strongly scaled. Unlike most of the members of the last family, whose food consists of worms and small insects, the members of this family live on hard seeds, etc., which their strong beaks enable them to crack.

1.—*Ægithali*, Veill.

Beak short, awl-like, more or less compressed.

Gen. *Parus*, L.

Beak short, straight; nostrils concealed by the feathers of the forehead; fourth and fifth wing feathers longest; tail always considerably longer than the wings. All small lively birds, variegated in plumage, remaining in Scandinavia throughout the winter. Mostly breed in holes of trees, and lay a great many eggs, white, generally spotted with red.

112. Parus major, L. Talg Mes. The Great Tit. D. F.

Length 5 in. 4 l.; tail 2 in. 5 l.; head and breast black; cheeks white; back olive green; breast and belly yellow, with a long dark stripe down the middle.

Common throughout the whole country as far up as Tornea Lapland. There is little or no difference in the plumage of the sexes in any of the tits.

113. P. ater, L. Svart Mes. The Cole Tit. D. F.

The least of all our European tits; little over 4 in. long; head and neck jet black, with a great white spot on the sides and one on the neck; back ash blue; breast and belly white; sides with a grey tinge.

Is never seen in the south during the summer, at which season it is confined to the fir forests, in the middle and

north of the country. I never met with it, however, in Lapland.

114. P. CRISTATUS, L. Toffs Mes. The Crested Tit. F.

Length about 4½ in.; tail 2 in.; head with a pointed crest; throat, collar, and front of the neck black; body colour above reddish brown, with a grey tint, below whitish; iris red-brown; legs lead-coloured; cheeks grey.

This handsome little tit is, I consider, very local, and is never seen out of the fir forests. Its northern range seems to be Angermanland, about 63° north latitude. In winter they flock much with the other tits and golden-crested wrens. The note is a peculiar shrill "kirr-it," quickly and often repeated, which is heard at a great distance. Go to nest early in April; nest always formed of moss, wool, and hair, in an old rotten stub; eggs six (I never saw more); the spots larger, deeper, and more crowded at the end than in any other of the tits. Not known in Denmark.

115. P. SIBIRICUS, L. Sibirisk Mes. F.

A little larger than the marsh tit; head brown; throat and breast black; cheeks white; belly and under rump ash-grey red; tail long, round, about three times as long as the tarsus; iris brown; legs lead coloured.

Is the commonest of all the tits in Lapland, and although accidental specimens have been killed in the south of the country in the winter, its summer range appears to be between 67° and 69° north latitude. The nest is formed of moss, invariably mixed, often lined with the hair of some dark field-mouse; eggs (I never saw more than five in one nest) resemble those of the marsh tit far more than those of the crested tit. Figured by Dr. Bree as the "Siberian tit."

116. P. PALUSTRIS, L. Kärr Mes. The Marsh Tit. D.

Length 4½ in., tail 2 in., beyond the wings 1 in. 2 l.; head black; cheeks white; sides of the neck greyish white; back and wings grey; breast and belly whitish; tail cloven; the outer feather a little shorter than the

others. The head of the marsh tit is glossy silk black; cheeks and sides of the neck dirty white; back blackish grey-brown; the edge of the outer web of the wing feathers is a little paler than the colour of the back.

Is common in the south and middle of Sweden throughout the year, but it is hard to define its northern limit, as it is still in dispute whether the *P. borealis*, De Selys, the northern form of this tit, is only a local form or a distinct variety. Both Nilsson and Wright give the *P. borealis* a place in their fauna as a distinct species; and without offering an opinion either way, I shall follow their example. According to Wright the *P. palustris* is not met with in Finland.

117. P. Borealis, De Selys. Grå Mes. F.

Size and colouring exactly like the last, except that the colours are always purer, and this I have remarked in all the specimens I have killed both in Wermland and Lapland. The head is dull velvet black; cheeks and sides of the neck clear white; back grey; the edge of the outer web of the wing feathers clear white. In *P. borealis* the tail appears a little longer than in *palustris*. Lilljeborg says that he can easily distinguish the one bird from the other when in company, by the stronger note of the *borealis*.

I met with it up at Quickiock, Lapland, but rare (I never, however, saw *palustris* there), and it is the common form with us in South Wermland.

The nest of the British marsh tit is always described as being built of moss, feathers, etc., now the nest of *borealis* is always altogether built of the finest shreds of the under bark of some dead tree—I fancy the alder; I never saw a bit of moss or a feather in one. Lays the largest number of eggs of any northern tit, often eight, exactly resembling those of the marsh tit. Figured by Dr. Bree from Lapland specimens, furnished by myself, as the "northern tit."

118. P. cæruleus, L. Blå Mes. The Blue Tit. D. F.

Smaller than the last; crown of the head bright blue; forehead white; body above olive green, under yellow.

Is one of the rarest of the northern tits, and confined to the middle and south of the country.

119. P. CYANUS, Pall. Azur Mes. D.

Length 5½ in.; tail long, rounded; the middle feathers blue, and as long as the rest of the body; head white, with a black-blue band through the eye, and another over the back of the neck; back and shoulders pale blue; tail and wings dark blue, under parts white; tail tipped with white; wings with two broad white bands.

This beautiful little tit, whose proper home is Siberia, is very accidental in Sweden, and is not even included by Wright in the "Birds of Finland." Is recorded by Kjärbölling to have been twice observed in Denmark, but not to have been shot.

Its habits resemble those of the blue tit, but it frequents the same localities as the marsh tit. Of its breeding habits little appears to be known. The egg in my collection from Siberia, which I received from a friend upon whom I can place every reliance, resembles more the egg of the blue tit than any other. It is rather larger, but the form is more oval than that of the marsh tit; the spots are fewer and much lighter, but it is absurd to describe the egg of a tit from a couple of specimens. Excellently figured in Bree's "Birds of Europe" as the "azure tit."

120. P. CAUDATUS, L. Stjert Mes. The Long-tailed Tit. D. F.

Length 6 in.; tail long, wedge-shaped, the middle feather black, and longer than the rest of the body; head, throat, and breast white; back black; shoulders and under tail coverts reddish; beak very short.

The colour of the long-tailed tits in the north appears to differ altogether from that in the southern forms. In France the male has black or red-brown spots, and a band on the head and neck.—Nilss.

Is sparingly distributed over all Scandinavia, at least as far up as the Dovre Fell. I never detected them breeding in Wermland, where, however, they are common in the early winter.

The bearded tit, which has occasionally been killed in South Denmark, is a stranger to Scandinavia, and this surprises me, considering the nature of the country. I may here remark that I was astonished at the few titmice we met with in Lapland. The only species I could identify were the Siberian tit and *P. borealis*, of which the former was by far the most common.

Gen. *Regulus*, Ray.

Bill much more slender than in the last; tarsi longer and thinner; nostrils oval, covered with one or two small thin feathers directed forwards; tail shorter and more cloven. The least of European birds. Builds a very small, pretty nest on the hanging branch of a fir; never lays in the hole of a tree. The only Scandinavian species remains in the country throughout the winter.

121. REGULUS CRISTATUS, Will. Kungs Fogel. The Golden Crested Wren. D. F.

Length about $3\frac{1}{4}$ in.; along the crown of the head a bright saffron yellow streak, and on each side of that a black one; cheeks and region of the eyes cinereous, without any white bands; colour above, brown olive green, below, pale greyish yellow; a white band over the wing.

This pretty, hardy little bird is met with in our midland pine forests throughout the whole year, always in the winter in company with the titmice, like butterflies flitting over the tips of the fir branches, ever in motion, and never appearing to sit still. According to Nilsson, is met with in Scandinavia as far up as the fir tree grows, even within the Polar circle. I saw one single specimen at Quickiock.

The fire-crested wren, which is included in the Danish, is a stranger to the Scandinavian fauna. These two little birds are much alike, and might very possibly be confounded by a casual observer. The colour of the crest of the head varies much even in the golden-crested wren with age, sex, and season, and the crests of both species assume a vivid orange colour in the nuptial dress. The fire-crested

wren is, however, best distinguished by the three bands on the cheek, two white and one black: the black line passes completely through the eye, and one white band passes above it and the other below it. The egg of the fire-crested wren is much darker than that of the gold-crest, and of a uniform dull reddish colour.

The Dalmatian wren—probably the rarest bird in Europe, which was added to the British fauna some years since, from a single specimen shot on the Northumberland coast by my friend, Mr. John Hancock, of Newcastle,—has been probably overlooked. Of late years specimens have been shot on Heligoland. This differs from either of the two last, by the streak of pale yellow on the top of the head (not a crest), the light lemon streak over the eye, and two of the same colour on the wing coverts. But the principal mark of distinction appears to be this, that whereas in the two last the covering of the nostrils consists of a single plumelet, in the Dalmatian wren it consists of several feathers.

2.—*Passerini.*

Beak short and conical, thick and strong; nostrils basal, generally covered with small feathers; tarsus short; outer toe joined by the first joint to the middle one. Live in fields or in woods, on corn, berries, etc.; flock in the autumn; many sing well. Mostly leave Scandinavia in the winter; moult only once in the year, in autumn, but many of them undergo a partial moult (by the edges of the feathers changing colour) in the spring.

Gen. *Alauda,* L.

Tertials about as long as the primaries; claws very long, especially the hind one; bill slightly convex above; nostrils hidden by feathers; tail moderate. Are all summer migrants to Sweden; build on the ground, and lay four or five dull coloured eggs; feathers of the head in all more or less crest-like.

122. ALAUDA ARVENSIS, L. Sång Lärka. The Skylark. D. F.

Length 7½ in.; tail reaches 4½ l. beyond the closed wings; hind toe 1 in., of which the claw is often 6 l.; colour above rusty grey, with dark spots, below rusty white, with black spots on the breast; the outer tail feather white at the tip.

A very early spring migrant to this country, and met with during the summer throughout the whole of Scandinavia nearly to the North Cape. I believe a few remain in Scania throughout the winter, if the weather be open.

123. A. CRISTATA, L. . Toffs Lärka. The Crested Lark. D. F.

Resembles the skylark in appearance, but is plumper, and has a shorter tail; legs flesh-coloured; eye red-brown; colour paler than in the last, more grey, and without the pure black spots; tail rusty yellow, instead of white, and the under wings and sides are red-yellow, which distinguishes the bird at a glance; crest on the head thin and pointed.

Most probably breeds sparingly in Sweden. I have shot both old and young birds in the south in autumn, but they are rare. Has only once been killed in Finland.

124. A. ARBOREA, L. Träd Lärka. The Woodlark. D. F.

Smaller and shorter than the skylark; tail shorter, reaches only ¼ in. beyond the closed wings; hind toe 7 l.; claw about 4 l.

Breeds in the southern and midland districts, but everywhere sparingly. Wright mentions a curious fact, that early in every spring they are seen near Helsingfors, in South Finland, for eight to fourteen days, when they disappear; nobody knows where they go to, nor are any seen again in the autumn.

The short-toed lark, *A. brachydactyla*, Gould, has not as yet been identified in Scandinavia. This is, however, very likely to be confounded with the woodlark, but the short hind claw, scarcely one-fourth of an inch, the shorter front toes, and the second wing feather being longest (in the woodlark the third is longest), are marks of distinction.

125. A. ALPESTRIS, L. Berg Lärka. The Shore Lark. D. F.

Length 7½ in.; tail 1 in. beyond the closed wings; third wing feather longest; colour reddish brown above, under parts white; forehead, front of neck, and a streak over and at the back of the eye sulphur yellow (which colour I have observed fades very much as soon as the bird is killed); a streak under the eye, and a band on the front of the throat black; on the sides of the back of the head are some pointed feathers, which can be upraised like a sharp horn on each side; tail black, edged with white; middle feathers red-brown; eye red-brown; legs black.

In the female and in the winter dress the colours are less pure and vivid.

Till lately this lark was considered so rare in Scandinavia that the capture of single specimens was deemed worth recording. However, as I killed more than fifty specimens in the winter of 1859 off the coast of Scania, in the south of Sweden, and again about sixty in the spring of 1862, at Quickiock, Lapland, I fancy they are not so very rare in this country.

In the winter they frequent the sandy banks close to the sea, and feed much on the heaps of dry sea-weed. They seemed to keep in small flocks; their flight sharp and low, and as they sweep over the ground they utter a sharp single call-note. They were by no means shy. They appeared at Quickiock about the middle of April, just as the snow was beginning to disappear, and remained in the low grounds round the village for about a fortnight, where their habits were precisely the same as on the southern coast. They then left, and went on to the fells to breed; and, strange to say, although we searched everywhere, saw the birds always on the fells during the whole summer, and killed young birds in the end of July, we could never succeed in taking a nest.

I observed that the colours in spring were very far brighter than in summer. Little difference in plumage

between the male and female In the spring when they first arrived I shot above fifty specimens, just round the village; strange to say, with one exception, they were all males. Nest, usually among loose stones and gravel, formed entirely of grass; eggs five, yellow grey, spotted all over with grey, blue, and brown.

Gen. *Emberiza*, L.

Bill short, strong; a knot on the palate inside the beak; wings short; feathers sharp, scarcely reaching down to half of the tail; first hind claw crooked, never longer than the toe.

126. EMBERIZA MILIARIA, L. Korn Sparf. The Common Bunting. D.

Length 7½ in.; colour above brown-grey, with black streaks; below whitish, with small black spots and streaks on the throat and breast; tail without a white spot on the end.

Is met with only in the south and south-east of Sweden, where it remains the whole year; not known in Norway or Finland.

127. E. CITRINELLA, L. Gul Sparf. The Yellow Bunting. D. F.

Length about 7 in.; head in male yellow, in female blackish olive green; throat and belly yellow; the two outer tail feathers with a white tip; winter dress darker.

One of the commonest birds in Scandinavia, and goes up into Lapland; remains in the middle and south of the country throughout the year.

128. E. HORTULANA, L. Ortolan Sparf. The Ortolan Bunting. D. F.

Length 6 in; head and neck above ash grey, with an olive green tinge; breast and belly brown-red; throat yellowish; beak and legs flesh red; a yellow spot over the eye; back greyish red-brown; rump rusty brown; eye brown. The colours in winter and of the female are not so pure.

A spring migrant to this country; comes late, and then frequents the new sown rye, where it always breeds; does not appear to go further north than Stockholm. The note is a monotonous "tink, tink, tink, tink-tjöhrr," and this I have heard late in the summer nights; builds generally in green rye; eggs six, pale grey, spotted and streaked with purple black. The *E. cæsia*, Cretz, is nothing more than a variety of this bird.

129. E. Schæniclus, L. Säf Sparf. The Black-headed Bunting. D. F.

Length 6 in.; colour black above, with rusty yellow feather edges; below white, with brown streaks on the sides; head and front of the neck in male deep black, with a white band on the back of the neck; the female has the crown of the head blackish, with rusty grey feather edges; a white streak above the eye.

Is met with in swampy places, and by the sides of water during the summer, from the extreme south of Sweden to the north of Lapland and Finland.

I once saw a pure Albino variety of the black-headed bunting, which was shot by a friend of mine near Gothenburg.

130. E. Rustica, Pall. Vide Sparf. F.

Rather smaller than the last; head above and on the sides black; a black streak along the crown, and another above each eye; body above red-brown or grey-brown, with black spots on the back; below white, a reddish band over the breast, and reddish spots along the sides; rump as well as the edges of the primaries reddish brown.

Its habits are rather like those of the last, and the eggs are nearly the same, but rather smaller. Very common in Siberia and North Russia; has been occasionally shot in Sweden; supposed to breed in Lapland.

The two white streaks on the head, the throat without black, the rusty red rump and back of the neck, and the reddish spots on the breast and sides, will always distinguish

this from the black-headed bunting, and also from the next. Figured by Dr. Bree as the rustic bunting.

131. E. PUSILLA, Pall. Dverg Sparf.

Length little more than 5 in.; head above black, with a brown-red band along its crown; sides of the head red-brown; upper part of the body black, with rusty grey feather edges, under parts white, with long black spots on the breast, sides, and neck.

Is common in Siberia and around Archangel, and has been accidentally shot in the south of Sweden during the periods of migration. According to Lilljeborg, frequents marshy places thickly covered with bushes; the song is clear and pretty, note resembling that of the warblers. Not known in Finland. Figured by Dr. Bree as the "little bunting." Second hind claw straight, longer than the toe.

132. E. LAPPONICA, L. Lapp Sparf. The Lapland Bunting. D. F.

Length 6½ in.; head and front of the throat in the male black, with a white streak over the eye and lower side of the neck; in female blackish, with white-grey feather edges; back of the neck in male red-brown; in female brown-yellow; upper part black, with rusty feather edges; breast in male black, in the female rusty grey, black spotted; tail blackish, the two outer feathers with a white spot; hind claw much longer than the toe.

Is never met with south of Lapland, save during the periods of migration. They were very common on the fell meadows round Quickiock in the middle of June, where they bred among rough grass and small willow bushes; nest always on the ground; eggs six, vary much in colour; they combine the characters both of the buntings' and the pipits' eggs; generally resembling those of the black-headed bunting, but more clouded and seldom streaked with purple. I have seen them so like those of the meadow pipit as hardly to be distinguishable.

The song of the Lap bunting is as rich and clear as any of our northern songsters; not so shrill as that of the lark,

but sweeter and more varied, for in this song the clear flute-like note of the corn bunting is blended with the varying strain of the skylark.

133. E. NIVALIS, L. Snö Sparf. The Snow Bunting. D. F.

Length near 7 in.; two white bands and a long white streak over the closed wings (in the young bird), or one white band and a large white spot (in the elder bird), or wings very white, with the exception of the black bastard wing and the last two-thirds of the primaries (very old bird); the three outer tail feathers white, with or without a black spot on the tip.

The old male, when it is at least four years old, has, in the summer dress—head, upper wing feathers, and all the under parts, white, with a slight rosy tint; back and shoulders glossy black; the three outer wing feathers white, with a black spot on the tip of the outer fan; the fourth black, with a white outer fan. The old female of the same age has in the summer less white on the wings, and the feathers on the head are blackish grey. In the winter dress the sexes more resemble each other; the black feathers have then a rusty grey or ash grey tint; head, neck, and cheeks tinged with chestnut brown, as well as the blackish rump.

The young bird in the first winter is much darker coloured than the old birds, and, therefore, easily distinguished even at a distance.

The breeding haunts of the snow bunting in Scandinavia are on the Lapland fells, and they only appear in the middle and south of the country in autumn and spring, and a few remain in the south during the winter. The very wildest fell tracts seem to be the peculiar summer home of the snow bunting, and although I have seen the birds evidently breeding all round me on the Quickiock fells, I never had the luck to find a nest; which, I fancy, as in the case with the shore lark, is often built under a large stone. In those desolate tracts pretty fell flowers are found in the summer here and there among the thin mosses and lichens, but no green herbs cover the shingle where it is bare of snow, and no trees

or bushes give a change to the flat monotony of the scene.

Here the snow bunting runs along the ground, or stretches out its wings for flight. During the whole short summer here are to be found numberless little open pools of water, which hold the larvæ of millions of midges and mosquitoes. These creep up on to edges of the pools to undergo their metamorphoses, and furnish an abundant supply of food to the snow bunting, and the few other birds that frequent these desolate regions in the short but beautiful northern summer.

Gen. *Fringilla*, Ill.

Bill small, conical; tarsi short; first three quill feathers nearly equal.

134. FRINGILLA LINARIA, L. Grå Siska. The Mealy Red-pole. D. F.

Length 5 in.; tail deeply forked; forehead and chin black; crown of the head glossy red, or reddish yellow; breast and rump, in the summer, in male rose red, in female dirty yellow, with brown spots; two white bands across the wings; neck, back, and shoulders grey-brown. The two-year old male has less red on the breast and rump; the one-year old male is very grey on these parts, but still with a slight tinge of red, and resembles the female, in which the crown of the head alone is red. In winter the male is much tinged with grey.

Of this bird Professor Sundivall makes two forms—the short-beaked form and the long-beaked form; in the former the beak is only $2\frac{3}{4}$ l. long, in the latter $3\frac{1}{4}$ l.. Nilsson says that the long-beaked form seldom comes further south than Stockholm. This is wrong, for in the winter it is much commoner than the other with us in Wermland. That there is a striking difference between the shape of the beaks in these birds is certain, but I have carefully examined so many specimens killed out of the same flocks, and seen the beaks gradually decrease in size, that I have come to the conclusion

that this is certainly no specific mark of distinction, nor do I believe that our lesser redpole (which is not recognized in the north as a distinct species) is anything more than a variety of the mealy redpole. The short-beaked form, however, seems rarer than the long-beaked.

The mealy redpole remains in Scandinavia throughout the year; but they all retire to the north in summer to breed, and I never obtained the nest anywhere except in Lapland. Next to the brambling, it is, perhaps, the commonest bird in the Lap forests, and I think the nest, cup-shaped, built of twigs and moss, lined with the pure white down of the willow catkin and ptarmigan feathers, one of the prettiest mementos of the northern forests. The eggs, usually six, resemble those of the lesser redpole precisely. It is singular that the mealy redpole, as well as some other northern birds, does not appear to obtain the full summer dress till many of the young are flyers.

135. F. Spinus, L. Grön siska. The Siskin. D. F.

Scarcely so large as the last; crown of the head in male black, in the female the same colour as the body; upper parts greenish, more or less spotted with black; under parts whitish yellow; rump bright yellow; sides with oblong black spots.

Seems to be confined to the midland districts in the breeding season, and I never met with it in Lapland; remains in the south through the winter. The nest is most difficult to find, always built high in a fir tree; not nearly so neat and pretty as the last; eggs five to six, grey-white, with purple red spot on the large end.

136. F. Carduelis, L. Steg litz. The Goldfinch. D. F.

Length 5¼ in.; a bright yellow band on the black wings; forehead and throat blood-red; occiput and nape black; back and sides yellow-brown; tail black, with white tip; under parts white; female less bright.

Is met with in the south and often in the middle of Scandinavia throughout the year. In the summer goes up as far at least as Norrland, but I never saw it in Lapland.

137. F. Cannabina, L. Hämpling. The Linnet. D. F.

About the size of the last. The male in the spring has the head and breast blood-red; neck and back of the head ash grey; back and shoulders chestnut brown. In the autumn the red becomes brownish, and the brown on the back greyish. Female, which never has red at any time, and young, resemble the male in autumn; beak as long as the hind toe, with half the claw; in summer stone brown, in winter grey.

Distinguishing marks between the common linnet, the mountain linnet, and the mealy redpole in the breeding dress:—

The mountain linnet has a red rump in the spring, but never a red head, and only one white band over the wing.

The common linnet never has a red rump, only part of the head and breast are red in the spring; no white cross band on the wing.

The mealy redpole has red over the forehead as well as on the rump, and two white bands across the wing.

Is common over the whole country during summer, at least as far up as Upsala. Some remain in the south during winter. I saw one or two up at Quickiock in the summer, but never took the nest there.

138. F. Flavirostris, Nilss. Gulnäbbad Hämpling. D. F. The Mountain Linnet.

About the size of the last; upper parts blackish, with rusty feather edges; throat rusty yellow; rump in male red; beak in summer yellow, in winter brown.

In the summer appears to be confined to the very northern parts of Scandinavia, but in the autumn comes down into the south. Neither this nor the last are so common here at any time as the redpole.

Both the linnets remain in the south during the winter.

Gen. *F. Erythrina*, Mey.

The scarlet bullfinch is common during the summer throughout the whole south-east of Finland. Is said to have been detected breeding on Sylt, in Denmark, and is reported

to have been once killed in Sweden; but I hardly think it safe to include it in either list.

139. F. Cœlebs, L. Bofink. The Chaffinch. D. F.

Length about 6 in. In the female and young the head is grey-green; back olive grey-brown; under parts pale grey. The old male in spring has the beak, head, and neck ash blue; back brown; under parts red-brown. In winter all the colours are duller and greyer.

Is one of the commonest of small birds throughout all Scandinavia during the summer. Most of them migrate in the winter.

140. F. Montifringilla, L. Bergfink. The Brambling. D. F.

About the size of the last; throat, breast, and shoulders rusty yellow; under wing feathers yellow, oval black spots on the sides; back in middle white, on the sides black; belly, and a streak over the root of the wings white. In the autumn the male has broad rusty grey feather edges on the head, neck, and upper parts, which in the summer are black. The female has but a slight resemblance to the male in colour; young like female.

Many remain in the south during winter. In the summer vast flocks go up to Lapland to breed, and when they first arrive, the whole forest rings with their monotonous "cree-cree."

In Lapland they breed early in June; nest generally placed in a small fir, like that of the chaffinch, but not so neat and pretty. The eggs also resemble those of the chaffinch, but generally a trifle smaller; much darker in the ground colour, and the purple lines and dots deeper, but not so distinct; in fact, the egg has a cloudy appearance. I never heard the brambling sing.

141. F. Chloris, L. Grönfink. The Greenfinch. D. F.

Length 6 in.; the outer wing and tail feathers bright yellow on the edges; male green; female greyish brown, with a green tinge.

Is more a midland than a northern summer bird. I have seen specimens in the winter in our midland forests; no where so common here as in England.

142. F. DOMESTICA, L. Gråsparf. The Common Sparrow. D. F.

Length about 6 in.; head above in male ash blue, in female brown-grey, a white band over the wing. In the female and young the body colour is greyish, without the chestnut brown and black, which distinguishes the male. In the winter both are more grey.

Is common throughout the year in all parts of Scandinavia where men live.

143. F. MONTANA, L. Pilfink. The Mountain Sparrow. D. F.

A little smaller than the last; head above dark red-brown; two white bands over the wings; back and shoulders red-brown; breast ash grey; belly white. In the female the colours are duller, as both are in the winter. No where so common as the last, and more local, but seems to have as high a northern range.

Gen. *Coccothraustes*, Klein.

Bill extremely large; wings short.

144. COCCOTHRAUSTES VULGARIS, Nilss. Stenknäck. The Hawfinch. D. F.

Length 7 in.; upper parts brown; the middle wing feathers in the end very much broader than in the middle, and cut off square, glossy blue-black; nape ash grey; a broad band of white across the wing; bill blue in summer, white in winter; the colour of the female is duller.

Is rare in the north; principally seen in the south; but I obtained one specimen in Wermland in the winter of 1864.

Gen. *Pyrrhula*, Briss.

Beak short and thick, as high as it is long; wings reaching scarcely to the middle of the tail; body round and plump.

145. PYRRHULA VULGARIS, Tem. Domherre. The Bullfinch. D. F.

Length about 6½ in.; head, wings, and tail black; rump white; back ash grey; a pale grey band across the wings; under parts in male red, in female grey.

Is met with in summer throughout the whole country, as far as Quickiock, Lapland; remains in the midland districts throughout the winter.

Gen. *Corythus*, Cuv.

Beak not so thick as in the last; upper mandible hooked.

146. CORYTHUS ENUCLEATOR, Cuv. Tallbit. The Pine Grosbeak. D. F.

Length 8¼ in.; wing breadth 14 in.; tail 3 in. 4 l.; wings and tail blackish, with two white bands across the former; body colour in the adult male deep red, female grey-brown or yellowish.

The male grosbeak, like the male crossbill, is subject to much variation in colour; and as I have paid some attention to the subject of the change of plumage in both these birds, I will shortly describe the different stages.

The nest plumage of the young pine grosbeak is dull olive-green, with a tinge of red occasionally on the head and breast, but I never saw the longitudinal dark spots which are peculiar to the young of the crossbills.

The dress of the young after the first moult in autumn is ash-grey in the male, slightly tinged with reddish brown on the breast; reddish yellow on the head. In the female, the tinge on the breast and head (especially) is much more yellow, and this is the only difference in the plumage of the two sexes at this age. The young males retain this plumage till at least the next or second autumnal moult, and that they can breed in this first plumage, I proved by taking the nest up at Quickiock, and shooting both male and female, which were very much alike. I cannot say how long they retain this first dress, but I fancy until the second

autumnal moult. I do not think longer, but though I cannot speak positively, this I can prove, that (although it is the common dress of the female at all ages) it is only intermediate, and assumed by the male before he comes to his red dress; for on August 4, I shot three specimens of these young ash-green males in deep moult, and the new red feathers were shooting out under the ash-green feathers all over the body, and most probably by the winter these birds would have been deep red. However, I do not think that all assume the rich full red dress at once, for I have shot male birds with a deep purple tinge on the red, very different from the fine carmine red which we have all supposed to be the mature dress of the male pine grosbeak.

Now I am not aware that a single naturalist besides myself has ever noticed this intermediate dress in the male pine grosbeak. In fact, very few have ever had the opportunity of studying these birds in the breeding season.

There is still another change of plumage in the male pine grosbeak, as well as in the parrot crossbill (and I have no doubt also in the common crossbill), which, as it has only been observed in confinement, our naturalists will not consider normal. I allude to a bright green yellow dress which is assumed by the male bird at a very advanced period of life. It is undoubtedly very rare, and I never saw it but once, and that was in *confinement*, but I have killed the old parrot crossbill from the nest in this dress, and as it was certainly not the result of confinement in this case, why should we not find the grosbeak with the same dress in a state of nature. I will admit that it is very rare, like the true grey plumage in the old goshawk, and perhaps in a state of nature, is found only in the very old males, although strange to say, in confinement it is assumed directly.

The nest of the grosbeak is one of the neatest I ever saw. Neither large nor deep, but very compactly and cleanly built, like basket work; the outside walls of very fine fir branches and thin cranberry fibres tightly interlaced, lined with fine stiff grass and a little hair. Placed usually

in a fir about ten feet from the ground, often in a conspicuous situation. Eggs, three or four, vary much both in size and colouring, but usually about the size of those of the hawfinch, perhaps a little thinner; pale blue-green ground, blotched and streaked with light purple and dark burnt umber spots and dots, always most apparent towards the large end. Average size, 1 in. × ¾.

The old birds are very silent during the breeding season, and never betray the locality of the nest. Both sexes have a beautiful, clear, loud flute-like song in the winter and spring, and a female which I had in confinement for above a year (and which was one of the tamest and nicest pets I ever had), would often wake me in the morning, by suddenly at daybreak breaking out into such a wild, loud, clear carol (which was, however, always short), the like of which I never heard from any other bird.

Their food in the forest is principally berries in the winter, in the spring and summer the young buds or embryo of the young fir branches. I very rarely saw them feed on a fir cone; they can, however, shell out the seeds as quickly as the crossbills if they like.

We never see the pine grosbeak in the midland districts, except in the winter, and their migrations to us are very irregular. They always leave very early.

Gen. *Loxia*, Briss.

Beak strong. Mandibles crossed at the tips. Tail cloven.

147. Loxia Pytiopsittacus, Bechst. Större Korsnäbb. The Parrot Crossbill. D. F.

Beak quite as high as the length of the under mandible. The tip of the lower mandible scarcely reaches the top edge of the upper mandible. Length, 7¼ in.; tail 2 in. 3 l.; tarsi 6 l. Ground colour of the old male, red. Female greenish grey.

The changes of plumage as described under the common crossbill, will doubtless apply to the parrot crossbill. In

fact, although I have not had so many opportunities of examining specimens of the parrot as of the common crossbill, I have seen enough to prove to me, that neither this nor the other obtain their full red plumage at the first autumnal moult, as most naturalists have erroneously stated.

I need here only remark, that the parrot crossbill is everywhere rarer than the common crossbill; and another curious fact I have remarked, is, that we never have the two breeding together in our forest in the same year. I fancy this depends much upon the state of the cones. The parrot crossbill feeds more upon the pine cones, the common crossbill on the fir cones.

I have heard some hazard an opinion that these birds are not distinct species, but such an idea cannot be entertained by any one, who, like myself, has had the opportunity of watching the birds in a state of nature, and does not merely study dry skins.

148. L. Curvirostra, L. Mindre Korsnäbb. The Common Crossbill. D. F.

The beak is not so high as the length of the under mandible, the long sharp point of which almost always reaches over the top edge of the upper mandible. Length, 6½ in.; wing breadth, 11½ in.; tail, 2 in. 2 l.; tarsus, 5½ in.

With regard to the changes of plumage in the crossbills, the following statements are the results of several years' observations.

The first dress, which is changed at the first autumnal moult, is greenish brown in both sexes, longitudinally streaked with darker brown, in fact very like the nest plumage. I believe that the parrot crossbill is subject to much the same changes as the common bird.

After the first autumnal moult, the body plumage is much the same, but all the under parts are tinged in the young males with yellow-orange. In the females, much brighter yellow. In the young males, the heads and rumps are orange; in the females, only tinged with yellow.

The striped feathers of the young are very apparent in both, all through the winter and following spring. They breed in this dress, which I fancy lasts them for one whole year.

I never saw the slightest indication that the plumage of the male would become red until the next moult, and I think this does not take place till the following autumn, and that then it will not be deep red, but orange yellow-red, for we find this colour in the birds breeding in this dress in February and March, although I believe a change in plumage may take place in May. It is clear that the bird does not become red at once, because these orange-red birds are not birds of the previous year, at least those which we find breeding in March. I am of opinion that the full red dress is not assumed until the third autumnal moult, and the males breed in two intermediate stages of plumage before it is resumed; because we find in the same forest, and at the same time, the males breeding in all these three stages of plumage.

I have proved that the very old parrot crossbill, becomes yellow-green with age in a state of nature, although I never obtained an old male common crossbill in this plumage.

In the summer, the red dress of the male crossbill seems to become darker.

The breeding habits of both species are alike, save that the parrot crossbill appears to go to nest a little later than the other.

The pairing season begins with us in January, the birds to breed in February. This is rather dependent on the season, but when we do get the nests, we never take the first later than the beginning of March, and after April we never take one with fresh eggs. The nest is placed on the top of a small pine, very rarely in a fir, never in the depth of the forest, but always on a stony rise where the trees are small, and stand wide apart. The nest (always open, even in the most inclement weather) of both species is much alike, coarsely built of sticks, lined with moss and grass. The eggs, three, much resemble those of the green linnet, but are larger. The egg of the parrot crossbill

is often scarcely larger than that of the common bird, but has always a bolder character. In the year 1863, I took above thirty-five nests of the common crossbill in our forest, but not one of the parrot crossbill. In the spring of 1864, we never saw a specimen of either in our woods, until the end of May. We rarely see any with us in the summer, even in those years when they breed with us. No nest is easier to find, for all the male seems to have to do with the work of building is to sit on the top of a pine and sing, thus betraying the locality of the nest.

Although they do not breed in colonies, you are sure to find more than one nest in the same district, and they have their favourite localities, where they breed year after year.

149. Loxia Bifasciata, Nilss. Bändel Korsnäbb. The Two-barred Crossbill. D. F.

I do not believe it is very clear which of the two species of white-winged crossbill we have in the north. Nilsson describes only one, which he calls *Loxia bifasciata*, and in his synonymes adds *Crucirostra bifasciata*, Brehm. Wright gives it the synonyme of *Loxia leucoptera*, Tem., but he adds the Swedish name of Bändel Korsnäbb, thus clearly identifying the Finland bird with Nilsson's *L. bifasciata*. Kjärbölling applies both of the synonymes, *C. bifasciata*, Brehm, and *Crucirostra leucoptera*, Wilson, to the Danish bird. Morris gives Nilsson's synonyme of *L. bifasciata* to the two-barred crossbill; but in describing the American white-winged crossbill (which M. de Selys Longchamps appears to have decided as a different species), he says that "a few are occasionally seen in Sweden." Now it appears to me that it is not at all clear which we have in the north, and whether or not we have both species (if indeed they can be considered distinct), or only one.

I never met with the bird in my life here, although I have more than once killed the common crossbill with two pale rose red bands over the wing, which Brehm, I believe, calls the *Loxia rubrifasciata*, but I do not think he makes it a distinct species.

Nilsson's description of the *L. bifasciata* is, length 6 to $6\frac{1}{2}$ in.; from carpus joint 3 to 7 l.; beak at the root $\frac{7}{16}$ in. high and $\frac{5}{16}$ in. broad; upper mandible $\frac{6}{8}$ in. long at point, strongly bent, long and pointed; under mandible $\frac{2}{16}$ in. at point, short; tail nearly 2 in. 3 l.; cloven reaches nearly 1 in. beyond the closed wings; tarsus $\frac{4}{8}$ in.; middle toe without the claw nearly half an inch, with the claw $5\frac{1}{2}$ l. The three outer primaries alike; beak and legs brown. His description of the colouring will not help us in determining the species.

Kjärbölling's description does not assist us at all. He only describes the white bars on the wings, and says, "that this lesser North American species," etc.

Wright gives the dimensions of the beak in the Finland specimens—upper mandible $5\frac{1}{8}$ l. long; under mandible 5 l.; height of the beak at the root $3\frac{1}{2}$ l.; breadth of the under mandible at the root 3 l.

The principal differences between the European and the American white-winged crossbill appear to be that the first is larger in the body; the beak is much larger (nearly as large as in the common crossbill), less compressed than in the American bird, and the point shorter. The tail is much less forked, and the plumage is not so brilliant a crimson. In Yarrell's representation of the two birds, there is one striking difference which, if correct, will serve to distinguish the birds at a glance. In the European bird the tips of the closed wings reach very little further than the root of the tail, whereas in the American bird they reach fully, if not more than half way down the tail.

Whichever the Scandinavian species may be, it is only an accidental visitant to Scandinavia, Finland, or Denmark, and has not been detected breeding in any of these countries. According to Lilljeborg, it breeds very commonly near Archangel.

Fam. 8.—Columbini.

Beak straight, compressed; upper mandible covered at the base with a soft swollen membrane, in which the nostrils

are placed; tarsi short, reticulated; toes divided. Lay two oblong white eggs.

150. Columba Palumbus, L. Ringdufva. The Wood-pigeon. D. F.

Length 17 in.; colour blue-grey; breast reddish; a large shiny white spot on each side of the neck; tip of the tail black, a white-grey band on its under side, and a large white spot on the wings. The female has the red breast, a little paler.

Common during the summer over the whole country, as far up at least as Angermanland. Migrates in the winter.

151. C. Œnas, L. Skogsdufva. The Stock Dove. D. F.

Length 12 in.; blue-grey, with a metallic green lustre on the sides of the neck, and a red tinge on the breast; upper tail coverts blue.

As common as the last in the summer, at least as far up as 61° north lat. Breeds in the hole of a tree.

152. C. Livia, Briss. Klippdufva. The Rock Dove.

Rather larger than the last; blue-grey, with a metallic gloss on the sides of the neck; rump white; two black bands across the wings.

Said to be the original stock of all our tame pigeons, on account of the white rump, and there may be something in this. You do not, however, see this white rump till the bird is flying.

Extremely rare in Scandinavia, and only known to breed in one place, Stavange, off the south coast of Norway, where they remain throughout the year.

Not known in either Denmark or Finland.

153. C. Turtur, L. Turturdufva. The Turtle Dove. D. F.

Length scarce 11 in.; tail rounded, with a white tip; edges of wings ash grey; under breast and belly whitish; body colour pale brown or grey-blue;

the yellow-brown shoulders have blackish spots. On the sides of the neck three to four white and black bars.

Is rare in Scandinavia, and appears to be killed accidentally at irregular seasons. Strange to say, two were shot up at Quickiock, Lapland, in 1811, and in 1863 I received a third specimen from that place, killed in July.

The *Turtur gelastes*, Tem., has been twice killed in Sweden, once up at Petea, Lapland. This is considered by Swedish naturalists as a distinct species. I, however, follow Dr. Bree, and think it is nothing more than a large variety of the common turtle-dove, with redder coloured abdomen.

DIVISION 2.—AUTOPHAGI.

The young of which can more or less feed themselves from their birth.

ORDER 3.—GALLINÆ.

Rasores.

Wings and tail short (with few exceptions); beak short, convex above, often furnished with a cere at the base; legs and feet strong, peculiarly formed for scratching and perching. Tail with fourteen to eighteen feathers.

Gen. *Perdix*, Lath.

Bill short and strong, naked at the base; tarsi and orbits naked; tarsus in the male with a hind spur; body round and plump.

154. PERDIX CINEREA, Lath. Rapphöna. The Partridge. D. F.

Length 1 ft.; forehead, sides, and throat rusty red; neck and upper breast grey watered; shoulders and

wing coverts with long white streaks. The side feathers of the tail rusty brown. In the female the red-brown spot on the breast is smaller than in the male.

Very common in the south and midland districts, but is not met with north of Stockholm.

155. P. Coturnix, Lath. Vaktel. The Quail. D.

Length about 7 in.; a pale yellow streak along the crown of the head, and a similar one over each eye; body above rusty brown or rusty grey, with black spots and yellowish longitudinal streaks; collar and breast red brown, with white streaks; belly white.

The Australian quail is not identical with the European. Is met with sparingly as far up as 59° north lat., probably further north.

Gen. *Tetrao*, L.

Beak short, thick, convex above; cere round the eye, naked, red, thickly covered with warts, but no signs of a comb; nostrils covered with a feathery skin; legs always more or less feather-clad; toes naked, fringed; tail in all (except the hazel grouse, which has but sixteen) consisting of eighteen feathers.

Tarsi feather-clad only to the middle.

156. Tetrao Bonasia, L. Hjerpe. F.

Length about 14 in., in Kalman Land over 15 in., feathers on the crown of the head long and pointed, shorter in summer than in winter; tail, except in the two middle feathers, with a broad black band before the grey tip. Throat in the male black, in the female rusty yellow. Head and back of neck, grey-brown, with black streaks; shoulders rusty brown; back and rump ash grey. Very prettily variegated.

Is not met with in the extreme south, but from the middle to far up into Lapland, is found in all the old rocky fir forests, and a favourite home of the hazel grouse is in woods of trembling poplar and birch, at the foot of high rocks. In the summer they chiefly frequent leafy woods, in the winter

fir forests. Appear to be always on the ground, except when frightened up into a tree. Call-note a soft whistle. Monogamous. In April the female lays seven to ten pale yellow-brown spotted eggs on a nest of moss. The whole family keep together during the autumn and winter, but several cocks are never known to pack, as is the case with the black grouse, and even the capercaillie.

Beautifully figured in Bree's "Birds of Europe" as the hazel grouse.

Tarsi feathered to the very toes.

157. T. Urogallus, L. Tjäder. The Capercaillie. F.

Length of male about 3 ft., of female a little over 2 ft. A good old male will weigh 10 to 12 lb., or even more; a female 6 to 7 lb.

I did not remark that the Lapland capercaillie were much smaller than those we kill in Wermland. Tail rounded; male, body watered with black, on the throat with glossy ash blue, on the wings with red-brown; female, speckled and wavy, with black, rusty yellow, and white. Barren hens resemble the cocks.

Is met with in Scandinavia wherever fir forests grow, from the north of Scania to the North Cape.

Polygamous. The female lays about seven eggs in May, much resembling those of the grey hen, but larger, and scarcely ever so deeply spotted.

158. T. Tetrix, L. Orre. The Black Grouse. D. F.

Length of male about 22 in.; female considerably smaller; tail cloven, the side feathers in the female much curved outwardly; female black, with a beautiful blue gloss on the neck and breast, a double white streak on the wings; under wing and tail coverts white; female speckled with rusty yellow and black transverse lines; tarsus not 1¼ in.; weight of male about 3 lb.

Is far more common and widely spread over the whole of Scandinavia than the capercaillie, but does not go so far north. Rare in Denmark.

159. T. Hybridus. T. Urogallides, Nilss. Rackelhane.

Produce of the black cock and capercaillie hen. Tail cloven, but the outer feathers are not curved as in the black cock; tarsus 2 in.; male blackish or black, with a lovely purple gloss on the neck and breast, a white spot over the arm-hole, and black and white under tail covert. Length 2 ft. 3 in., wing breadth 3 ft. 3 in.; tail 9 in.; beak black. Tail in shape like that of the grey hen, has eighteen feathers, of which the outer are 1¾ in. longer than the eight middle ones, which are equal.

Female 9 in.; tail 6½ in., speckled with black and rusty yellow transverse bands; breast darker rusty brown.

Weight of a good male about 5 lb.

The female might be mistaken for the female black grouse, but may always be distinguished by the under tail coverts; in the grey hen they are longer than the middle tail feathers, in the female *T. medius* they only reach half way down them.

Wing feathers in the *T. medius*—first rather shorter than seventh; second like the sixth, third, fifth, the fourth a little longer and longest.

In the black grouse—first, eighth, second, sixth, and third a little shorter than fourth, which is longest.

That the Rackelhane can lay is, I believe, tolerably well proved, for I have seen an egg laid in confinement. It was very similar to that of the grey hen, but rather larger. I do not believe, however, that the birds themselves can perpetuate their race.

The Rackelhane is not so very rare, especially in those tracts where the male capercaillie are shot out, for then the females allow the black cock to tread them.

I never, however, had the luck to procure more than one myself, and this was in April, 1864. It came down on a moss to play with the grey hen. The note is a very hoarse one, rather like some parts of that of the capercaillie. Directly this bird pitched on the moss, he drove all the

black cock off. They play most, I believe, on the ground, but also in trees. The female appears much more difficult to obtain than the male.

Produce of Black Grouse and Willow Grouse.

160. Tetrao Hybridus Lagopides, Nilss. Rip Orre.

Much more rare than the last. I never saw but one specimen, and this was shot in North Wermland. It appears that no Swedish naturalist has seen this kind in the summer plumage, but the winter dress is as follows:—

Male: black above, watered grey, or the feathers have white edges; underneath and on the neck and wings white and blackish, with a great black spot on the front of the neck.

Female: above speckled with white, rusty yellow, and black; underneath white on the neck and sides, with black and rusty yellow transverse bands. The middle feathers of the tail speckled rusty yellow, the outer ones speckled on the outer edge.

Tail cloven, with black feathers; feet white, clothed with feathers; toes on the outer half annulated, and fringed on the edges; tarsus about 1⅛ in.

Length of male 18 in., of which the tail forms 6 in.; beak black, like that of the willow grouse, but much larger.

Like the black grouse, the naked red spot over the eye is covered with warts, but like the willow grouse it forms a crenated comb. As in the latter, the feet are feather-clad, but their outer extremity is like the black grouse, covered with horny rings, under which lie a row of horny teeth. Like the black grouse, the tail has eighteen feathers, and the side ones are a little bent, but the tail is much less cloven than in the black grouse, and the middle feathers are broadly edged with white on the tips, as in the willow grouse. In size it stands between the black grouse and the willow grouse.

Gen. *Lagopus*, Veill.

Beak as in the last; naked red crest over the eye, rises

in a crenated comb. Tarsi and toes in winter, thickly clothed with feathers; claws in winter long and broad; tail consists of sixteen feathers, of which all but the two middle ones, lying above the others, are black at all seasons.

161. Lagopus Subalpina, Nilss. Dal Ripa. F.

Length 16 in.; tail beyond the wings 3 in.; female about 1 in. shorter; the primaries at all seasons white, with brown shafts.

Summer dress: head and throat in front red-brown in the male, or rusty yellow in female, with black spots; back black, and speckled with red-brown in male, or rusty yellow in female.

Winter dress: snow white, with a black beak and black tail feathers. In this dress it is not easy to distinguish the female willow grouse, from the female ptarmigan, (the male ptarmigan may always be known at all seasons by the black mark between the eye and the gape, which is wanting in the male willow grouse); but the beak is always much thicker, the bird is larger, and there is this difference in the relative proportions of the wing feathers:—

In the willow grouse, the first wing feather is $1\frac{3}{8}$ in. shorter than second, which is $\frac{3}{8}$ in. shorter than third, which is equal to the fourth and longest; fifth always longer than the second.

In the ptarmigan, the first wing feather is $1\frac{1}{8}$ in. shorter than second; this is $\frac{3}{8}$ in. shorter than third, which is like the fourth and longest; fifth shorter than second.

In the summer, the female willow grouse may always be known from the male by the deep black chin, which in the female is rusty yellow, and by the red-brown feathers on the breast and throat. Moreover, in the male the under tail coverts are red-brown, speckled with black, and marked with a dark band in front of the white tip; in the female they are rusty yellow, with black transverse bars, and this I have always found a safe mark of distinction. Figured by Dr. Bree as the "willow grouse."

The willow grouse is met with very plentifully from North Wermland, about 60° north lat., up to the extreme north of Lapland. Never in any forests which lie far from the foot of the fells.

Both the ptarmigan and the willow grouse are strictly monogamous, but they both have a kind of lek or play in the spring, in which, however, the male does not tread more than one female, to whom he attaches himself during the whole breeding season. The old ptarmigans leave the females while they are sitting, and pack together in small companies (in this respect they much resemble the common wild duck), but join the brood again in autumn. The male willow grouse, however, never leaves the female or young brood.

The willow grouse is always found in the forests, generally among bushes and near water, and I never by any chance saw one higher up on the fells than the bushes grow, and never found a nest any where except in the forest. They occasionally perch, but rarely except in the winter. The call note is exactly that of the red grouse.

The female lays, in the end of May or early in June, seven to nine eggs, so like those of the ptarmigan as scarcely to be distinguished, except that they are perhaps a very little larger and blunter at the ends.

The usual weight of an old male willow grouse is sixteen ounces, English; that of a ptarmigan ten ounces.

162. Lagopus Alpina, Nilss. Fjäll Ripa. The Ptarmigan. F.

Length 14 in. Winter dress, pure white, with black tail feathers, and a black moustache in male. Autumn dress: blue-grey, finely watered with black; female also grey watered. Summer dress; male, head, neck, back, and breast, black, more or less spotted with white, and finely speckled with rusty grey. Female, covered with black spots, and pale rusty yellow wavy lines.

I am clearly convinced, that the ptarmigan moults three times in the year, and that all the changes of plumage take place through a regular moult.

I never saw the ptarmigan off the true fells, nor in the forests on their sides. They go to nest on the fells a little later than the willow grouse. Southern range in Scandinavia, the Dovre Fell.

163. L. Scoticus, Gould. Mo Ripa. The Red Grouse.

Length, 16 in. The whole plumage, in both sexes, chestnut brown variegated with black; tail with sixteen feathers' the six outer ones on each side dusky; the wing primaries at all seasons dusky brown.

Has lately been introduced into Sweden, and some pairs have been turned out near Gothenburg. They have already bred in a state of nature, and as they are to be preserved by the king's order for some years, it is probable that the red grouse will now be established in Scandinavia.

Gen. *Pterocles*, Tem.

Feet with short toes; tarsi only feathered in front; tail conical, the two middle feathers much elongated, as in the skua's.

164. Pterocles Alchata, Steph. The Pin-tailed Land Grouse. D.

Length, to the end of the long thin tail feathers (which extend 3 in. beyond the shorter feathers of the tail), 13 in. Head, nape, and back, in male, olive-green; upper tail coverts, red fawn, pencilled with black; throat black; side of the neck, and a band across the crop, dark fawn edged with black; belly pure white. In the female the colours are much duller.

Was added to the Scandinavian fauna in 1863, by specimens killed in one of the eastern provinces, and also in Denmark, when Europe was overrun by a flight of these African birds.

ORDER 4.—GRALLÆ.

Waders.

Legs high, naked more or less over the knee. Hind toe generally placed high up, often wanting. Beak long, round. Wings long; under wing coverts or scapulars very long. Tail short, of twelve to twenty feathers.

They are all summer migrants to the north, although occasionally an odd specimen remains in the south through the winter of the purple sandpiper, and even of the woodcock and water rail.

Fam. 1.—PRESSIROSTRES, Cuv.

Beak straight; legs tolerably high. Live on dry sandy plains, or stony sandy beaches, not on mosses or swamps.

Gen. *Otis*, Lin.

Beak as long as the head; upper mandibles swollen; gape wide; nostrils oval, open in the middle of the beak; legs high, naked above the knee, reticulated. No hind toe. Second, third, or fourth, wing feather longest. Tail rounded, twenty feathers.

The bustards form a good link between the *rasores* and the true waders, partaking of the characters of both.

165. OTIS TARDA, L. Större Trappon. The Bustard. D. F.
Length, 3 ft. 9 in.; beak, from gape, 3¼ in. Naked space above the knee 2 in. Colour, head and neck pale ash grey; mantle deeply spotted transversely with black and rusty yellow. Wing feathers black-brown, white at the roots. In the male, at the root of the under mandible, is a plume of narrow feathers about 7 in. long, falling backwards, covering a strip of bluish grey skin, on the sides and front of the neck. Legs black; tail rounded. The female resembles the male, but is smaller, and wants the moustache.

Was formerly common on the sandy plains of South

Sweden, is now very rare, but not extinct. A summer migrant.

166. O. TETRAX, L. Lilla Trappen. D.

Length, about 1½ ft. Beak, from gape, 1½ in. Colour, head black, with rusty yellow spots. Wing feathers white. Mantle, in the female, finely speckled; in the male, finely watered with black, on a chestnut ground. Neck, in the male, black, with two broad white cross bands; in the female, speckled.

Is only accidental in the north.

167. O. HOUBARA, L. Krage Trappen. D.

Length, 26 in. Beak long, much compressed at the root. A long tuft of white feathers on the crown of the head, and on either side of the neck, a bushy tuft of long black and white pendent feathers. Upper parts rusty brown, barred with darker brown. Sides of the neck grey, under parts white. Legs dark green. Eye reddish.

Has been once shot at Flensburg, in Denmark, and once on Gotland. Must not be confounded with Macqueen's bustard, *O. Macqueenii*, Gray, which has once been killed in Britain. Figured by Dr. Bree as the "ruffed bustard." The pratincole and the stone curlew are included in the Danish fauna.

Gen. *Charadrius*, L.

Beak straight, shorter than the head; head large, with high forehead, and large eyes; nostrils small, long, opaque, basal; nasal channel extending two-thirds of the length of beak; tarsi slender; outer and middle toes connected by a membrane; wings long, first feather longest; tail square or rounded; twelve feathers. All lay four eggs, on the bare ground, except the dotterel.

A.—With no hind toe.

168. CHARADRIUS HIATICULA, L. Större Strandpipare. The Ring Dotterel. D. F.

Length 7½ in.; the outer half of the beak black, the inner half as well as the legs yellow; all the wing

feathers with shafts white only in the middle; the outer tail feather white, the following blackish, with long white tips; eye brown; upper parts grey-brown; a broad gorget of black on the breast.

Very common during the summer on most of the coasts, and I killed them up in Quickiock, Lapland, by the side of fresh water.

169. C. Minor, Mey. Mindre Strandpipare. The Little Ring Dotterel. D. F.

Colour like the last, but it is smaller; bill entirely black; legs flesh colour; the whole shaft of the outer wing feather white; outer tail feather white, with a black spot on the inner fan, the rest with white tips.

Not so common as the last, nor does it go so far north. I, however, frequently take the nest on the Wener. The egg is much smaller than that of the last, and the dark spot on the grey-brown ground smaller.

170. C. Cantianus, Lath. Hvit Bröstad Strandpipare. The Kentish Plover. D. F.

A little larger than the last; upper parts cinereous brown; crown of the head and nape brownish red; a black patch on each side of the breast, which does not form a band; beak and feet black; the two outer tail feathers altogether white, the rest brown.

Not nearly so common in Scandinavia as the last, but I think more so in Denmark. I never met with it except on the very southern coast of Scania.

Eggs have much the character of the last, but always when fresh, are darker, and have a kind of mouldy appearance.

171. C. Morinellus, L. Fjäll Pipare. Lafol, Lap. The Dotterel. D. F.

Length 9 in.; female generally larger and handsomer than the male; beak and eye black; colour above brown ash, edged with reddish; breast and sides red-brown; a white band over the eye; a white gorget on the breast; the outer wing feather with a white shaft. In the winter the colour is duller.

Breeds only up on the northern fells, where they are very common in the summer. The full number of eggs is invariably three, dark clay-brown, blotched with black.

172. C. Pluvialis, L. Ljung Pipare. The Golden Plover. D. F.

Length about 11 in.; upper parts dusky brown, spotted with yellow. In the spring and summer the under parts and breast are black; in winter, and in the immature dress, grey, with yellow spots. But at all seasons the long axillary plume under the wing is white; in the American golden plover always grey.

One of the commonest birds on the moors and fells of Scandinavia, during the summer, right up to the North Cape.

B.—Hind toe rudimentary.

173. C. Helveticus, Bp. Kust Pipare. The Grey Plover. D. F.

Rather larger than the last, which it much resembles in the summer dress, but is always lighter in colour, and the axillary plume is *deep black at all seasons*. In the winter the plumage is much whiter, and the breast, instead of being dark black, is white, with dark spots.

There is a great mystery regarding the breeding haunts of this bird. I have shot the old birds on the southern coast of Scania, in August, in nearly full summer dress, as well as birds of the year, so that it was reasonable to suppose they were bred somewhere on this continent. But I never could succeed in procuring the egg here. It certainly does not breed at Quickiock, and the egg has never been taken at Munioniska either by the collectors of the late Mr. Wolley or any one else. Still, for all that, I do believe that it breeds on the Scandinavian fells.

The egg is figured by Morris from a specimen "taken by Mr. Tristram in Finland, 1862." No doubt this is genuine, but it is a great pity he does not give us more particulars of the capture of so rare an egg.

Mr. Newton has described and figured the egg in the "Proceedings of the Zoological Society," 1861, and his figure, in the main, agrees with Morris's, but the egg is considerably smaller. This I rather wonder at. It was taken by Middendorff on the Taimyr river, North Russia, 74°, 1st July, 1843, and is also doubtless a genuine egg. As Mr. Newton observes, the egg greatly resembles in character that of the lapwing and dotterel, but is much larger. The specimens in my cabinet were procured from Greenland, and I have every reason to believe in their authenticity. They are fully as large as Morris's figure, and have more the character of the eggs of the golden plover, than of the dotterel.

Gen. *Vanellus*, Briss.

Beak as the last; nostrils pierced through; legs high; wings round; third feather longest; long crest on the back of the head.

174. VANELLUS CRISTATUS, Mey. Toffsvipa. The Peewit. D. F.

Male usually larger than female; length 12 in; under wing coverts black in male; grey in female; back and scapulars olive green; crown, fore part of neck, and breast greenish black; a black crest of feathers, 4 in. long, on the back of the head; belly white; under tail coverts orange; tail white, with black tip.

Is very common in the south of Sweden during the summer; comes sparingly up as far as Wermland, and goes up certainly as far as Upland. I am not certain that three is not the full number of eggs as often as four. Any how, I have taken both three and four closely sat upon.

Gen. *Strepsilas*, Ill.

Beak quite as long as the head, conical; nostrils pierced through; legs short; front toes cloven to the root; hind toe placed high; wings long, pointed; first feather longest.

175. STREPSILAS INTERPRES, Ill. Roskarl. The Turnstone. D. F.

Length 9 in.; colour above variegated, white, black, and ferruginous; throat, hinder part of the back, and root of the tail white; breast black; tail shorter than the closed wings; beak and eyes black; legs yellow-red.

Is common in the south of Sweden, and in the Baltic, and on the Norwegian coast; goes up within the Polar circle. I am not certain whether the turnstone does not as often sit on three eggs as four.

Gen. *Hæmatopus*, L.

Beak much longer than the head; nostrils small, pierced through; tarsus reticulated; outer and middle toe webbed; wings pointed; first feather longest.

176. HÆMATOPUS OSTRALEGUS, L. Strand Skata. The Oyster-catcher. D. F.

Length 16 in.; wings even with the tail; bill $2\frac{5}{8}$ in.; colour of both sexes alike; head, neck, scapulars, primaries, and upper parts of the breast black; the rest of the body white; beak, eyes, and legs blood red. The winter dress is marked by a white semicircular cravat on the throat.

Common on most of the Scandinavian coasts, from Scania up to within the Polar zone. I received a specimen from Quickiock, which lies at least a hundred miles inland from the sea, shot in July, 1863, and they are also sometimes seen on the Wener. I never saw more than three eggs in a nest, often only two.

Fam. 2.—CULTRIROSTRES, Cuv.

Beak long, straight and sharp; neck long; legs high; four toes; the point of the hinder toe does not reach the ground; tibia in all, and the tarsi in some, reticulated; wings round; tail feathers twelve.

All large waders; sexes alike; but the young do not attain the mature dress until they are three years old, when they commence breeding.

Gen. *Grus*.

Beak a little longer than head; nostrils oblong, pierced through the beak at about half its length; legs very high; skin on the tibia and toe roots reticulated, on the tarsi scaly; outer and middle toes joined by a web; third and fourth wing feathers longest.

177. Grus cinerea, Bechst. Trana. The Crane. D. F.

Length 4 ft.; beak about 4 in.; tarsus 10 in.; ash grey, with black wings, and a large whitish grey spot on the side of the neck and head; crown of the head naked, covered thinly with hair, red and warty.

Is principally confined to the morasses in the middle and south of Sweden, although a few go up as far as Lapland. They arrive here about April, and I have counted twenty-nine together upon one field, just after they had come. I think the loud trumpet bray of the crane, which may be heard at a long distance, the wildest and finest note of any bird we have.

They breed commonly in our morasses; the nest, a heap of dry rushes and grass, flat, not unlike that of the coot; eggs, as far as I have seen, always two, nearly as large as swan's eggs, greenish grey, irregularly blotched with dark brown. I do not believe the old bird ever sits on the nest during the day.

178. Grus Virgo, Briss. Numidisk Trana.

Much smaller than the last; colour blue-grey; behind each ear a bushy tuft of white feathers; pointed black feathers, about 9 in. long, hang down in front of the breast; some of the wing coverts much lengthened; eye red; beak yellow ochre, black at root; legs black-brown.

One single example which I have seen stuffed in the museum at Orebro, was shot in Nerike in June, 1857. Beautifully figured in Bree's "Birds of Europe" as the "Numidian crane."

Gen. *Ciconia*, Briss.

Beak nearly double the length of the head, straight, conical, pointed; nostrils basal; eyes encircled by a naked patch of skin, which is distinct from the beak; legs long; back toe reaches the ground with its posterior third part; skin on the tarsi and tibia reticulated; third wing feather longest.

179. Ciconia alba, Briss. Hvit Stork. The White Stork. D. F.

Length about 3½ ft.; beak 6½ in.; tarsus 8 in.; whole body white, with black wings; beak and legs red; cere black; eye brown.

Is very common in Denmark. In Sweden is confined to the southern provinces of Scania and Halland, where they breed. Are said to lay three to five white eggs, but never to hatch more than three. I think, however, that three is the usual number laid.

180. C. Nigra, Briss. Svart Stork. D. F.

About the size of the last; head and neck glossy black, with blue, green, and copper-coloured reflections; breast white; back glossy black, with a bronze tinge.

Has been occasionally shot in Denmark, and once in Finland.

Gen. *Platalea*, L.

Beak long, flattened at the end to a large round broad spatula; hind toe resting on the ground, throughout its length.

181. Platalea Leucorodia, L. Sked Stork. The Spoonbill. D.

Length about 1 ft. 4 in.; beak 7 in. 2 l. long, 1 in. 10 l. broad at the tip.

The whole body white. In the older birds there is a long crest on the back of the neck, which, as well as the breast, is rusty yellow; eye red; beak black, with yellow tip; legs black.

Has been several times shot in Denmark; twice in the south of Norway. Was named by Linnæus as a Swedish bird, which in summer was met with in Westerhotten and Lapland; but no modern naturalist can corroborate this statement. Is certainly only accidental in the north.

Gen. *Ardea*, L.

Beak as long or a little longer than the head; the whole of the hind toe resting on the ground; nostrils basal, oblong; eyes placed in a naked cere, which joins on to the beak; wings round.

Distinguished from all the other waders by the peculiar shape of the neck (which can be drawn back and laid on the shoulders), and the four bare patches under the feathers, covered only with fine down, one on each side of the breast, and one on each side of the rump. I think three may be taken as the full number of eggs of all this genus.

DIURNAL. Neck long, and covered with short feathers.

182. ARDEA CINEREA, Lath. Häger. The Heron. D. F.
Length 3 ft. 3 in.; beak 5 in.; tarsus 6¼ in.; much longer than the middle toe; crest on back of head 6 in.; colour above ash-grey; tail, wing primaries, and crest black; long white feathers hanging 6 to 8 in. down on the lower part of the neck; beak and eye yellow; legs grey-brown, over the knee orange red. (This, however, is not the case in all.) In the old female the tarsi and crest are much shorter than in the male; iris yellow.

Common in some places, in the south of Scandinavia. I have occasionally procured specimens both of old and young birds in Wermland, but I do not think they go further north in the interior. On the Norwegian coast appear to go up as far as Trondtheim. Breed in colonies, like rooks on trees; eggs generally three, pale blue-green.

183. A. PURPUREA, L. Purpur Häger. The Purple Heron.
Length about 32 in.; tail 5 in.; beak from gape 6 in. 4 l.; naked part of tibia 2 in.; colour above dark slate grey; neck rusty yellow, with black longitudinal

streaks; head and neck black, with long drooping pointed feathers from the back of the head; scapulars long and drooping, rusty yellow.

One example has been killed in South Scania in 1833.

184. A. Egretta, L. Hvit Häger. The White Heron.

Length about 40 in.; beak from the gape 6 in.; whole of the body white; no crest on the back of the head; naked part of the tibia, 4 in.

The only authentic Scandinavian specimen was shot at Westerås on the east coast of Sweden in 1856.

Nocturnal. Neck thick and short, covered with broad feathers.

185. A. Stellaris, L. Rördrum. The Bittern. D. F.

Length 30 in.; beak 3 in.; tarsus 4¼ in.; colour all over speckled, and spotted with rusty yellow and black; neck feathers long; wings covered with blackish and rusty yellow transverse bands. Little difference in the appearance of the female, except that she is rather smaller than the male.

I never myself met with the bittern in Sweden, though it is said to be sparingly distributed everywhere up as far as Lodermanland; but I do not think it common.

186. A. Minuta, L. Dverg Rördrum. The Little Bittern. D. F.

Length 15 in.; beak 2 in.; tarsus 1 in. 7 l.; colour above black-brown, under rusty yellow, with or without longitudinal streaks; tibia feathered nearly to the knee.

Only accidental in Scandinavia; said to breed in the south of Denmark.

The squacco heron and the night heron are both included in the Danish fauna.

Fam. 3.—Longirostres.

Beak long and thin; hind toe when present always placed high; wings pointed; first or second feather longest.

All frequent marshes and low swampy ground or river sides, never sandy heaths; all are monogamous, and lay their three to four pyriform eggs on the ground. Are all summer migrants to the north.

GROUP 1.—Legs long, naked, high above the knee; the outer toe always joined at the root to the inner toe by a web. Are all taller than those in the second group, never hiding themselves among grass; are shy, and when disturbed, utter loud cries.

A.—Beak curved downwards like a sickle.

Gen. *Ibis*, Cuv.

Beak long and thin, very much bent, four-cornered at the root; nasal furrow extends along the whole length of the beak; nostrils basal, oblong; a naked tract between the beak and the eye; legs high; tibia reticulated; tarsus with transverse scales; second and third wing feathers longest.

187. IBIS FALCINELLUS, L. Svart Ibis. The Glossy Ibis. D. F.

About as large as the curlew, but the beak is thicker and longer, and the legs much higher; tail 4 in.; beak in a straight line 5¼ in.; tarsus longer than the middle toe; upper parts of the body dark green, with metallic gloss; under parts chestnut brown; legs green; beak greenish black; iris brown.

Is only a casual visitant to Scandinavia, but has been killed as far north as Helgeland, in Norway; and, strange to say, one specimen was shot in Iceland, and is now preserved in the Copenhagen museum.

Eggs said to be two or three, pale sea-green colour.

Gen. *Numenius*, Lath.

Beak bent down, long, thin, round; nasal furrow extending only two-thirds of its length; nostrils basal; the whole face covered with feathers; the naked part of the leg equal to the length of the beak; hind toe reaches the ground

only with its tip; first wing feather longest; tail with twelve feathers.

188. NUMENIUS ARQUATA, L. Större Spof. The Curlew. D. F.

Length about 23 in.; beak in a straight line 5 in.; tarsus 3 in. 2 l.; the lower part of the tarsus and toes with transverse scales; head blackish grey, with no streak on the top; rump and the long axillary plume white spotted; head, neck, breast, and all the upper parts rufous ash; belly white, the whole variegated with dusky spots. The male is more black and rusty brown, the female more brown and rusty grey.

The young bird can be known by the broad upper part of the tarsus, and the shorter, straighter beak.

Is very common in the south and middle of the country. Goes far up within the Polar circle, but never so high on the fell sides as the next.

As far as I can see, three is as often the full number of eggs as four.

189. N. PHÆOPUS, Lath. Liten Spof. The Whimbrel. D. F.

On the middle of the head a white-grey streak; rump white; axillary plume white, with black transverse bands; length 1 ft. 5 in.; beak $3\frac{1}{8}$ in.; tarsus 2 in. 2 l.; head, neck, breast, and upper parts pale ash, spotted with dusky; all the under parts and rump white.

Are seen only in the south and midland districts, during migration to and from their breeding places on the fells in the very north.

The egg of the whimbrel is smaller than that of the curlew, which it rather resembles; but I have seen the egg of Richardson's skua so like it, as to be scarcely distinguishable. Three was the full number I ever took out of a nest on the fells, but still they may lay four. My opinion, however, is that the curlews and the godwits will often sit on less than four eggs, whilst in every other genus of this family, the full number of eggs is invariably four.

Gen. *Limosa*, Briss.

Beak long and straight, weak; nasal furrow extends along the whole bill; nostrils basal pierced through; legs very long; wings and tail as last. The females are always larger and handsomer than the males.

190. LIMOSA MELANURA, L. Svartstjertad Långnäbba. The Black-tailed Godwit. D. F.

The outer half of the tail black; the base white at all seasons; a white spot on the wings; beak straight; the claw of the middle toe long, dentate on the inner edge; length about 16 in.; beak from the gape 5 in.; tarsus 3 in. 2 l.; naked part above knee 2 in.; tail 3 in. 2 l.

In the summer dress rusty red, especially on the breast, with dark transverse spots all over the body, and black on the hinder part of the back; wings black; a white stripe over the eye; belly white. In the winter the upper parts are brown-grey, with paler edges; throat white; neck and breast pale grey, with small spots. The young are like the old in winter, but more rusty.

Is met with throughout all Scandinavia, and breeds in many places as far up as the North Cape.

Eggs pyriform; vary in colour from dark green to light olive brown, faintly blotched with darker spots; not so large as that of the whimbrel.

191. L. RUFA, Briss. Roströd Långnäbba. The Bar-tailed Godwit. D. F.

Tail at all seasons streaked with white and black-brown bars; beak in the old birds double as long as the tarsus; in the young birds one and a half times as long; middle claw short, not dentate; no white spot on the wing.

Length 14 to 15 in.; beak about 4 in.; tail 3 in. Resembles the last in colour, but in the summer the rusty red colour underneath extends from the chin down to the tail, and is much deeper and purer than in the last.

Breeds only, as far as I could see, in the far north, and is met with in the south only during the periods of migration. I believe, however, that both have an equally high northern range.

Eggs smaller than the last, and much more difficult to procure. I have generally seen them lighter in colour.

The terek godwit, *L. Cinerea*, Gm.—which may be distinguished from either of the last by being only half the size, by its long, very recurved beak, and by its uniform grey colour at all seasons, never with a rufous tinge,—is common around Archangel, and is probably to be met with occasionally on the Scandinavian continent.

Gen. *Totanus*, Bechst.

Beak long, nearly straight, at the root weak and compressed; round and hard at the tip, upper mandible longest; nasal furrow longer in some than in others; nostrils small, basal; legs long, naked higher up over the knee than in the *tringa*, but in both the hind toe is small, and only reaches the ground with its tip.

Subgen. *Glottis*, Nilss.

Beak long, recurved at the tip; nasal furrow does not extend half way down the beak; middle feather of the tail longest.

192. TOTANUS GLOTTIS, Bechst. Gluttsnäppa. The Greenshank. D. F.

Beak as long as the tarsus, much higher than it is broad; legs long; middle of the back and rump, white at all seasons; tail white, with small brown transverse bands; shaft of the first pinion feather white, the rest brown; axillary plume slightly banded with light brown; length 14 in.; wing from carpal joint 7¼ in.; beak 2¾ in.; tail 3 in.; front of the back and shoulders rusty grey, with large dark longitudinal spots on the feathers; all the under parts white; head and neck lighter than the back; legs yellowish green; beak blackish in the young, blue-grey from the root to the

middle. In the winter there is much more white, and the whole plumage is much lighter.

Common over all Scandinavia during the periods of migration, but seems to prefer the north of the country for breeding. Nilsson says they breed in Gotland. Kjärbölling says they breed commonly in some parts of Denmark, and I have seen them myself in the end of June in North Wermland, but I never obtained the egg except from Lapland. Eggs four, laid on a few pieces of dry grass, sometimes up in an open place in the forest, always on the ground; considerably larger than those of the redshank; ground colour clay brown, blotched all over with deep purple brown and fainter patches. The eggs are, however, subject to variation, and are sometimes very handsome, especially when fresh. Although there is rather a resemblance, the larger size will always distinguish this egg from that of the redshank.

The habits of this bird much resemble those of the green sandpiper, wild and shy, often perching on trees. When disturbed, flies high over the forest, uttering a loud, shrill "chee-wheet, chee-wheet."

Straight Beaks.

Subgen. *Totanus*, Nilss.

Beak longer than the head, straight, slender, thin; nasal furrow in the old bird extends scarcely half way down the bill.

193. T. Calidris, Bechst. Rödbent Snäppa. The Redshank. D. F.

Beak shorter than tarsus; both mandibles red at the root for half way down the beak; tip black; legs bright red in the old birds at all seasons, in the young dirty reddish yellow, as well as the base of the beak; all the three front toes joined at the root, by a web; length about 11 in.; beak 1 in. 6 l.; carpus joint 6 in. 3 l.; tail 2½ in.; summer dress, upper parts rusty grey-brown, with black spots, under white, with blackish spots,

which on the throat, and front of the breast are long and close together; on the belly fine and small, on the sides transverse; tail white, finely barred with black. In the winter the whole upper plumage is more ash grey, and the under parts are less spotted; the young bird is more rusty.

Much commoner everywhere than the last; breeds in the south, and goes up also quite as far north as the greenshank.

194. T. Fuscus, Bechst. Svart Grå Snäppa. The Dusky Redshank. D. F.

Beak as long as the tarsus; the under mandible alone red at the root; legs brown-red; never like the last, deep red; size rather larger than the last; summer dress grey-black; back and shoulders with a metallic gloss, and covered with very fine white spots; tail black-grey, with twelve to fourteen white transverse bands.

The young bird is best known by its broad thick tarsus, especially at the knee; colour above ash or brown-grey, and this is much the winter dress of the old birds.

Although not uncommon in many parts of Scandinavia during the seasons of migration, the summer home of the dusky redshank is Lapland, and I never procured the eggs from any other part of this country. Eggs four, considerably larger than those of the redshank, thick, and have more the colouring of the egg of the great snipe. They vary, however, I believe, much.

195. T. Ochropus, Tem. Gråbent Snäppa. The Green Sandpiper. D.

Length about 9 in.; beak same as tarsus, 1 in. 3 l.; tail even with the wings, about 2 in.; the female rather the largest, and the beak and legs about one-eighth longer; all the shafts of the wing feathers dark brown; colour of the under wing dark; rump and lower part of the back white; upper body colour very dark brown, with metallic gloss, covered with small white or yellowish spots; axillary plume white, with black transverse

bands; legs ash grey, only green on the knees; beak green-brown, with black tip; tail white, with broad black bands, which are not so apparent on the side eathers; iris dark brown.

Is very common during the summer, especially in the midland districts, but does not go up into Lapland, where, however, the wood sandpiper is common at that season.

Morris observes that he is inclined to believe the green sandpipers do not all leave England in the summer, but only are less noticed from their resorting then to the most sequestered spots to breed. Now of all our waders this is the noisiest, and there is little trouble in finding the locality where it breeds, for the old male is always about some brook in the neighbourhood, and I have before noticed that the loud wild cry of the green sandpiper and greenshank are much alike; but although it is easy enough to know whereabouts the bird is breeding, a man might seek till doomsday for the eggs, if he followed the stereotyped description of, I believe, *all* our naturalists, and sought for the nest where they tell us, "in sand, on a bank, or among grass by the side of a stream." The fact is, I do not believe any naturalist had seen the really authentic egg of this bird until I discovered its breeding habits some few years since. In Sweden the green sandpiper never makes a nest on the ground, like the rest of its congeners, but invariably lays its four pyriform large eggs—of a very light ground colour, spotted all over sparingly towards the small end (at the top the spots are much larger, darker, and crowded together), with two shades of purple and umber brown—in an old deserted nest of a squirrel, jay, or crow (I once, however, saw them in a new common thrush's nest), in the forest, often far from water, always in a fir tree, sometimes forty feet from the ground. How the old bird takes her young down to the ground I cannot say, but I once found four very small young ones, apparently not a day old, at the foot of a fir, and in the nest I found shells of the eggs still wet inside.

196. T. GLAREOLA, Tem. Grönbent Snäppa. The Wood Sandpiper. D. F.

Length 8½ in.; beak shorter than tarsus, which is 1 in. 4 l. long; the shaft of the first primary is white, the following white only on the under side; colour of the under wing light; tail white, with deep, well defined brown transverse bands on all the feathers; axillary plume not regularly barred, as in the last, but covered with largish brown spots; legs all greenish; upper parts deep brown, spotted with white; under parts and rump white, but not nearly so conspicuous as in the last.

More common and much more widely dispersed over Scandinavia than the last, from Scania right up into Lapland; breeds always on small open mosses, but often far away from the forests; four eggs, generally laid under a small bush of bog myrtle, etc. They are not nearly so large as those of the last, much darker coloured, and the spots much larger and deeper.

This bird has a very pretty little call note, it can hardly be called a song, during the breeding season. In habits it more resembles the redshank than the last.

197. T. Hypoleucos, Tem. Drill Snäppa. The Common Sandpiper. D. F.

Length about 8 in.; beak 1 in.; tarsus 7 l.; all the upper parts cinereous brown, with an olive gloss; shafts of all the primaries brown; under parts white; rump the same colour as the back (not white), and this will distinguish it at a glance from the others.

The commonest of all the Scandinavian sandpipers during the summer from Scania up to the North Cape.

The spotted sandpiper (*T. Macularius*, Tem.), the *T. Semipalmatus*, Tem. (American willet), and the marsh sandpiper, (*T. Stagnatilis*, Bechst.), are supposed to have occurred in Sweden, but are not sufficiently authenticated to warrant their being placed in the Scandinavian fauna.

Gen. *Machetes*, Cuv.

Although possessing many characters in common with the last genus, *totanus*, as they have also some of the charac-

ters of the *tringa*, it has been deemed safest to include the ruff in a separate genus, the principal characters of which may be said to be: tarsus elongated; beak as long as the head, thin, straight, compressed at the base, then round, with a blunt tip; upper mandible longest, its tip rather bent down over the point of the under mandible; nasal furrow extending the whole length of the beak; hinder part of the back and rump dark at all seasons; outer and middle toes united at the base; front toes fringed on the sides; neck in the male with an ornamental ruff during the breeding season; forms a very good link between *tringa* and *totanus*.

198. MACHETES PUGNAX, Cuv. Brushanė. The Ruff (male). Reeve (female). D. F.

Male: length above 12 in.; wing 24 in. broad; from carpus 7¼ in.; tarsus 2 in.; beak 1¼ in. Female: length 10 in.; wing 19 in. broad; from carpus 6 in; tarsus 1⅝ in.; beak 1⅜ in.; wing feathers blackish, with the shaft of the first white; the three outer tail feathers of one colour, generally grey; beak red or brown-yellow, darker at the point, which in the winter is black; legs reddish or saffron yellow, in the young birds green.

Summer dress: the male is distinguished by a naked face, covered with warty pimples, and a large ruff or cravat of different colours, scarcely two birds being alike. It is said (how proved I don't know) that the male bird has the same coloured cravat every year. The female in the summer has no cravat; head grey; neck and breast with blackish spots; back, black-brown, and shoulders with rusty or white-grey feather edges. In the autumn and winter, both sexes resemble each other, save in size (the cravat or ruff is laid aside in July, when the face of the male becomes feathered); crown of the head black, with rusty grey feather edges; neck and breast rusty grey, with black spots; back and shoulders like the female in summer, but more grey. The young bird is more rusty coloured than the old. Is common in many parts during the summer, and goes far up into Lapland.

Group 2.—Legs not so long as in *totanus*, nor so naked above the knee; all the toes divided down to the roots.

Hide themselves much among grass, and fly up generally silently.

Gen. *Tringa*, Nob.

Beak thin, compressed at the root, weak throughout its length; nasal furrow long; legs small; tarsus never longer, generally shorter, than beak; wings and tail as in *totanus*.

Subgen. *Pelidna*.

The middle tail feathers longest, and pointed; beak more or less curved, longer than tarsus.

199. Tringa maritima, Brun. Svart Grå Strandvipa. The Purple Sandpiper. D. F.

Length about 8 in.; beak $1\frac{3}{8}$ in.; tarsus $\frac{7}{8}$ in.; tail $2\frac{2}{8}$ in. The male rather smaller; beak very slightly bent down; tarsus rather shorter than the middle toe; upper tail coverts black at all seasons; tail rounded.

Summer dress: black above, with a violet tint, and pale rusty brown feather edges; under parts white, with blackish spots. They lose this dress in September, when the upper parts become black, with ash grey feather edges; head, breast, and sides black, with white edges; wing coverts and feathers edged with white.

Breeds only in the far north, and is never seen in the south of Scandinavia, except in the autumn, and occasionally in winter. It is said by Sommerfeldt to be very common during the summer on the north coasts of West Finland, where, probably, they breed. I never, however, received the egg from Lapland, although I have from Iceland and Greenland. I believe it breeds more on the coast than on inland moors.

200. T. Subarquata, Nilss. Bågnäbbad Strandvipa. The Curlew Sandpiper. D. F.

Tail shorter than the closed wings; beak curved, longer than the tarsus; rump and upper tail coverts white, or with a very few brown spots; beak and legs black; eye dark brown, about the size of a lark in the body; length about 8 in.

Young dress: grey-brown above, below grey-white; upper part of neck pale ochre yellowish, streaked black.

Summer dress: upper parts black, with rusty brown edges; shoulders brown-grey; hinder parts black-grey; all the under parts red.

Winter dress: upper parts brown-grey, under whitish.

Is certainly rare everywhere, and only seen on the southern coasts during the periods of migration. I have shot them myself on the coast of Scania in August, in full summer dress. This is one of the few of our northern birds whose eggs I never saw, nor can I hear of any one who possesses a really authentic one. Baedeker, in his splendid German work on eggs, figures two varieties of the egg of the pigmy curlew, both considerably larger than that of the dunlin, and the one which I should take to be the type form, rather resembles the egg of that bird in colouring. If it breeds anywhere in Scandinavia, I fancy it is on the west coast of Finmark, probably not far inland.

201. T. ALPINA, L. Föränderlig Strandvipa. The Dunlin. D. F.

Length, 8 in.; tarsus, 1 in.; beak 1¼ in. Beak very slightly curved, compressed, flattened at the tip; upper tail coverts black and grey (*never white*, as in Schinz's sandpiper, which much resembles the dunlin, if indeed it is anything more than a variety of that bird). Tail longer than the closed wings; beak and legs black. Summer dress: black above, with red-brown feather edges; a black shield on the breast; neck and throat spotted; belly and undertail coverts white. Winter dress: ash grey above, with black feather shafts and brown-grey shoulders; under parts white; wing feathers in all seasons black.

There is sometimes met with in the south of Sweden, for I have shot such on the coast of Scania, a larger form of dunlin, which is about 9 in. long, with a wing breadth of 15¼ in.; carpus 5 in.; tarsus 1 in.; legs brown; breast, in the autumn, spotted like a thrush.

Is one of the commonest of all the genus in Scandinavia, and we meet with them in the summer, as well in the south of Scania, as on the Lap fells.

Schinz's sandpiper is said to have been detected breeding in East Finland, but I think on questionable authority.

202. T. PLATYRHINCHA, Tem. Bred Näbbad Strandvipa. The Broad-billed Sandpiper. D. F.

Less than the last; a little over 6 in. long; beak longer than the head, 1 in.; tarsus 7 l.; tail shorter than the wings; first and second wing feathers alike, and longest.

The peculiar shape of the beak will always distinguish this from any other of the class. This is round, and when seen from above, much broader than that of the dunlin. At the root, however, more high than broad, but in the middle, depressed, round, more broad than high, rather curved at the point; under root of the beak reddish; thin black nasal furrow, short. The female has the beak nearly double the size of that of the male.

In plumage, has a great resemblance to the jack snipe, especially in the long bronzed scapulars. The winter and summer dress are much alike, but the latter is rather greyer.

Has always been considered very rare in Scandinavia, but as I have shot the bird, not unfrequently, both in Scania and the middle of Sweden, taken the eggs myself in Lulea Lapland, and received them from East Finland, I do not think it is so very rare. I do not, however, think that they breed anywhere except in the very far north. Of all the sandpipers this is certainly the shyest and most unobtrusive in its manners, and its custom of creeping through the grass like a little mouse, causes it to be seen very sel-

dom. When flushed (which is never until you nearly tread upon it), it rises with a faint single call note, flies for a short distance, then suddenly drops, and it is difficult to rise it a second time. The nest which I found was on a tussock of grass, in a large fell meadow half way up to my knee in water. The eggs were four, very pyriform. Ground colour grey-brown, covered all over with minute spots of light umber brown, nearly hiding the ground colour; size 1¼ in. by ⅞ in. There is a particular character about the egg, as well as the bird, which will always distinguish it.

In June, 1864, I killed five specimens in a meadow up at Dalby, North Wermland, where they were evidently breeding, although I was unable to find the nest.

(*a*). Beak straight, as long as the tarsus.

203. T. MINUTA, Leisl. Lilla Strandvipan. The Lesser Stint. D. F.

Length 6 in.; tarsus ⅞ in.; tail with three grey side feathers; all the wing feathers with white shafts in the middle. Summer dress: upper parts black-brown, with red-brown feather edges, under parts white, breast reddish brown, with black streaks. Winter dress: brown ash grey, with black feather shafts, crown of the head rusty grey, and a brown streak between the beak and eye.

Is met with on all the Scandinavian coasts in the spring and autumn, but I do not believe any one has yet found out its breeding place in Scandinavia. The egg is figured by Baedeker as considerably larger than that of the Temminck's stint. Ground colour light drab, thickly covered with brown spots, especially at the larger end; of different shades and sizes. Morris's figure rather resembles this, but his egg is smaller.

Von Middendorff obtained one nest with four eggs on the River Taimyr, 74° north lat. The egg, according to Mr. Newton, agrees very much with that of Temminck's stint, which, according to Middendorff, breeds in the same locality,

but is a much rarer bird there. I fancy many of the rarer Scandinavian waders and water fowl breed more to the east.

204. T. Temminckii, Leisl. Temmincks Strandvipa. Temminck's Stint. D. F.

Very much resembles the last in size and proportions, but the side feathers of the tail are all equal, the outer ones white, and the first wing feather alone has a white shaft, the rest are all brown. The colour is darker; back blacker, with broad rusty yellow spots, the breast rusty grey, spotted black. In the winter the colours are all greyer.

Is much commoner than the last in Scandinavia. Eggs four, very pyriform, chocolate brown, covered with a deeper shade of small fine spots all over.

I have taken the nest in Lapland, and as I have shot the old bird in June in Wermland, I have every reason to believe that it also breeds there.

(*b*). All the tail feathers of an equal length, beak straight, a little longer than tarsus.

205. T. Islandica, L. Islands Strandvipa. The Knot. D. F.

Length 10 in., about the size of the missel thrush; beak 1¾ in.; tail, which is always grey, 2¾ in. Summer dress: black above, with rusty yellow spots; under parts rusty brown, nearly rusty yellow; wing feathers always black, with white shafts. Winter dress: ash grey above, with brown feather shafts and black transverse spots; under parts white-grey, with a faint rusty tint on the front of the throat, breast and sides; beak and legs black-green; iris brown. The young bird is more brown-grey; sides of the breast and belly transversely streaked with small brown streaks, upper tail coverts white, with black wavy bands. In the old birds they are rusty yellow, with black bands.

Is only seen in the south during the periods of migration. I could never hear of it with certainty breeding

in Scandinavia. The eggs which I have received from Greenland are rather less than those of the double snipe (not so long), and rather resembling them in markings, but not so dark.

Gen. *Calidris*, Ill.

In most respects resemble the sandpipers, but may be always distinguished by the total absence of the hind toe.

206. CALIDRIS ARENARIA, Ill. Föränderlig Sandlöpare. The Sanderling. D. F.

Length 8 in.; beak 1 in.; tarsus 1 in.; tail 2 in.; secondaries and tail feathers always with white shafts. Summer dress: rusty red and black above, a yellowish stripe over the eye; breast and sides of the head, pale rusty red. In winter dress, ash grey above, white underneath. Young, under parts and a stripe over the eye white; back and shoulders brown-black, with yellowish feather edges; back of the neck grey-white, spotted.

Is not often seen in Scandinavia, and then only during the periods of migration. I never saw the eggs, nor do I believe the bird breeds in Scandinavia. The egg figured by Baedeker is about as large as that of the purple sandpiper, minutely spotted with brown, on a light white-green bottom. He gives Greenland as a breeding place, and as I see them advertised in an English dealer's catalogue at 2s. 6d. each, they must be common enough somewhere, although no oologist that I know has yet been able to find out where.

Gen. *Scolopax*, L.

Beak always considerably longer than tarsus, thin, weak to the point, which is hard and blunt and formed into a nail; upper mandible longest; both mandibles furrowed along the edge beyond the middle. Eyes large, set far back right under the crown of the head. Legs moderate, slender, naked space above the tibia, very small. First and second wing feathers longest. Tail with twelve to sixteen feathers.

A character of this genus is the large pale longitudinal streaks down the back. The colour is not changed either by difference of sex, age, or season. All summer migrants to the north.

Subgen. *Rusticola.*

Tibia feathered to the joint; tarsi short; toes altogether divided; hind claw shorter than toe.

207. Scolopax Rusticola, L. Morkulla. The Woodcock. D. F.

Length 14½ in.; beak 2 in. 6 l.; tarsus 1 in. 3 l.; tail, beyond the wings, 1 in., with twelve feathers. Back of the head with black and rusty yellow transverse bands; whole plumage above variegated with black, grey, and ferruginous yellow-white; underneath with transverse undulating lines. The female may be distinguished from the male by the outermost primary, which is rusty yellow or white on the edge, without spots. In the male, this feather is barred transversely on the edge with black. Weight varies; a good cock, especially in the spring, will weigh twelve ounces.

The woodcock generally makes its appearance on the southern coast early in April, and leaves again in the end of October or November. During the summer they are thinly spread over the whole country to far up in Norway, but not so far as Lapland.

They breed generally in rocky fir woods, and the female lays four thick, shortish, pyriform eggs, larger than those of the great snipe; light greyish yellow, strewed all over with brown and ash grey spots of different sizes. Nests early in May.

Subgen. *Scolopax.*

Lower part of the tibia naked; tarsi more elongated; toes entirely divided or united at the base with a very short membrane; hind claw longer than the toe.

208. S. Major, Gmel. Dubbel Becassin. The Great Snipe. D. F.

Tail rounded, sixteen feathers, of which the fourth and fifth side feathers are pure white on the outer edge; the shaft of the outermost wing feather white, all the under parts spotted and barred with black; length 11¼ in.; beak 2⅝ in.; tarsus 1¼ in.; but the male is proportionably smaller. The young birds, in the first autumn, have shorter beaks, and fewer, if any, white outside tail feathers. These are probably attained at the first moult, for this species is often described as being without any white outer tail feathers, and at other times with as many as five or six on each side of the tail. It is larger and paler in colour than the common snipe, but the beak is shorter; upper parts glossy black-brown, with rusty coloured spots and pale cross bands over the wing. General weight nine ounces.

It is supposed that in Sweden we have two sorts of double snipe, the one larger than the other. I always thought the same, but not so much on account of the size, as of the difference in the tail feathers, which may, after all, be dependent only on age.

The double snipe, in the summer, appears to be sparingly dispersed over the whole of Scandinavia, but is, I think, a very local bird. I never took the eggs in South Wermland, although I feel certain that they breed here; a friend of mine, however, took the nest with four eggs, in June, 1864, near Gothenburg. I have received the eggs from North Wermland, and it is said to be common up the Alten, near the North Cape. The greatest breeding locality is near Upsala in Upland, where hundreds are shot every spring on their playing grounds, for they have a regular "lek" or play in certain meadows, like the black grouse, when they are pairing.

The egg is large, pyriform; colours bold and clearly defined; light clay ground, covered with large blotches of three shades of red-brown crowded at the large end. The eggs of all the snipes have precisely the same character, and nothing can distinguish them but the size.

209. S. Gallinago, L. Enkel Becassin. The Common Snipe. D. F.

Tail, with fourteen feathers, rusty yellow, with black band and white tip; the outer wing primary white on the external fan; breast and belly always white, unspotted; weight four ounces; length about 12 in.; beak 3 in.; tarsus $1\frac{3}{8}$ in.; male rather smaller, has not nearly so many white spots as the last, and having no white bars on the wings, the whole body colour above has a darker appearance.

Common during the summer, and breeds over all Scandinavia.

210. S. Gallinula, L. Half Enkel Becassin. The Jack Snipe. D. F.

Tail sharp, twelve feathers; side feathers dark grey, spotted; a long broad black band on the crown of the head. Length, $8\frac{1}{2}$ in.; beak $1\frac{5}{8}$ in.; tail extends nearly 1 in. beyond the closed wings; tarsus under 1 in.; colour as in the last, but the breast is pale grey with brown spots, and the back and scapulars are black, glossed with green and purple.

I could never find the jack snipe breeding either in the south or middle of Sweden, but as I have shot the young birds, apparently only just flyers, in South Wermland, in August, I am pretty certain they were bred in the vicinity. It is apparently the latest breeder of all, for the eggs I have received from Lapland have been taken in the end of July; eggs very like those of the common snipe, but a little rounder and considerably smaller.

Fam. 4.—Macrodactyli.

Beak short, compressed, and high; legs longish; toes very small and long; hind toe resting with about half its length on the ground; tail short, twelve feathers; body slender and compressed. The sexes are alike, but the male is the largest; are all summer migrants to the north.

Gen. *Rallus*, L.

Beak and tarsus of same length; beak small, long, pointed, curved down, compressed throughout its whole length; nasal furrow extends half way down the beak; legs short; toes long, divided; third wing feather longest; body compressed at the sides.

211. RALLUS AQUATICUS, L. Vatten Rall. The Water Rail. D. F.

Length 10 in.; beak $1\frac{6}{8}$ in.; middle toe over 2 in. Olive brown above, with black spots; face, breast, and throat, blue-grey; sides of the body black, transversely barred with white; beak red, with a brown back and tip. The young bird is known by the white throat, rusty yellow breast, with black transverse bands, and the white bands on the black belly have rusty yellow edges.

I never saw the water rail in Sweden although, according to Nilsson, it is met with (sparingly, however) both in the north of Norway and in the south of Sweden. Some appear to remain in the south all the winter. It is singular that this little bird is a constant resident in Iceland, where it is called "keldu svin," and according to Faber's account, leads a melancholy life in the winter in the neighbourhood of the warm springs.

Gen. *Gallinula*, Lath.

Beak much shorter than tarsus, straight, high, and compressed at the sides, equally pointed above and below, root above more or less bare; nostrils much larger than in the rail, placed nearly in the middle of the beak; second and third wing feathers longest; legs and toes as in the last; tail short, nearly hidden in the coverts.

1.—Tibia naked; moult in spring and autumn.

212. GALLINULA CREX, Lath. Äng knarr. The Land Rail. D. F.

Length about 11 in.; beak from the forehead 7 l.;

tarsus and front toe equal, 1 in. 4 l.; colour above, rufous brown; the centres of the feathers dusky, beneath yellowish white; wing coverts ferruginous; bill brown; legs grey-brown; eye pale brown.

Is common during the summer throughout the whole country, from Scania at least, as far north as Upsala.

213. G. Porzana, Lath. Småfläckig Sumphöna. The Spotted Crake. D. F.

Length 8½ in.; beak ¾ in.; tarsus 1⅛ in.; colour brown olive green, bestrewed with white spots and streaks; back spotted with black; outer wing feather white on the outer edge; wings reach down only to two-thirds of the tail; bill yellow green orange at the base; legs yellow-green; eye red hazel.

Is not rare, especially in Wermland, and goes up at least as far as Upland.

I have generally found the full number of eggs six, laid in wet grass, on a thick careless flat nest of rushes. I have taken fresh eggs early in August.

214. G. Pusilla, Lath. Lilla Sumphöna. The Little Crake. D.

Wings and tail of equal length; outer wing feathers of one colour; body above olive brown, with black spots; below slate blue, unspotted; bill and legs sap green; eye red; wings unspotted.

Has only once been killed, accidentally, in Gotland, in 1856. More common in Denmark.

Baillon's crake, which may be known from the last by the white spots over the wings, by the flesh-coloured legs, and by the wings reaching only to half the length of the tail, has not as yet been detected in the north.

2.—A naked round spot on the forehead; moult only in spring.

215. G. Chloropus, Lath. Grönfotad Sumphöna. The Moor Hen. D. F.

Length 13½ in; beak, with naked spots, 1 in. 5 l.; tail 3 in.; tarsus 1 in. 7 l.; whole body colour blueish

grey-black, with dark olive brown mantle, underneath more grey; ridge of the wing and under tail coverts white. In the old birds the naked patch on the forehead, as well as the beak (all except the yellow tip) bright red; legs green; naked space on the tibia red.

The female can only be known by the smaller plate on the forehead, and paler colours.

In the young, beak and forehead plate are brown-green; tip of the beak olive green. Must be rare in Sweden, for I never met with one. Is, however, sparingly dispersed over the whole country, with the exception of, perhaps, the far north.

Gen. *Fulica*, L.

Characters much the same as in the last, but the front toes are very long, and bordered by a broad scalloped membrane.

216. FULICA ATRA, L. Sothöna. The Coot. D. F.

Forehead plate, and beak white; whole body plumage black; under tail coverts black, a white band over the wing; length 18 in.; tarsus 2 in. 3 l.; beak 1 in. 3 l.; the female a little smaller.

Is about as common as the last. I never met with either. It seems, however, to have a wide northerly range, for according to Sommerfeldt, two young coots were shot at Vardo, near the North Cape, in 1857. I have more than once heard of their being shot in South Wermland. Strange to say that Sommerfeldt mentions in his list two coots, both young birds, being shot near the North Cape in October, 1857.

Fam. 5.—HYGROBATÆ.

Beak long and thin; legs thin; front toes united as far as the first joint, after that, lobed as in the coot and phalaropes, or webbed to the points of the toes, as in the avocet; sexes alike in plumage; all summer migrants to the north.

Gen. *Phalaropus*, Briss.

Beak long, straight, round; nasal furrow extending the

whole length of the mandible; front toes lobed; hind toe small, sitting high; first and second wing feather longest; tail feathers twelve, of one colour, neither banded nor spotted; feather covering tight and downy, as in the water fowl.

217. PHALAROPUS PLATYRHINCHUS, Tem. Brednäbbad Simsnäppa. The Grey Phalarope. D. F.

Beak broad, flattened at the top; tail long and rounded; hind toe very slightly lobed; length 9 in.; beak 1 in.; tarsus $\frac{7}{8}$ in.; tail $2\frac{1}{4}$ in.; beak at the root 2 l. broad and $1\frac{1}{4}$ l. high, flattened, and the nasal furrow extending throughout its whole length. Winter, grey above, white underneath. Summer, brown above; feathers edged with rufous; breast, belly, and all the under parts red, unspotted; beak reddish yellow, black at the tip; legs green-grey.

Is rare in Scandinavia, and although I never obtained the egg in this country, I fancy it breeds on the coast of North Norway, and in West and East Finland.

218. P. HYPERBOREUS, Lath. Smånäbbad Simsnäppa. The Red Phalarope. D. F.

Beak thin, round; hind toe with no signs of a lobe, but the great difference in size will always distinguish this from the last; length 7 in.; tarsus $6\frac{1}{4}$ l.; beak 7 l.; tail 2 in.; beak at the root about 1 l. broad and 1 l. high, tapers off gradually, and is throughout its whole length, thin and pointed.

Summer dress: upper parts black-brown, with rusty feather edges, and a white band across the wing; crown of the head and crop ash grey; top of the neck white, under that a red band; belly and under parts white.

Winter dress: ash grey above, under white; and this is the dress of the young bird, only not so pure.

Far commoner than the last in Scandinavia, but I do not think that they breed anywhere except in the Lapland fell valleys. They breed commonly near Quickiock. Eggs four; pale olive green, covered with large and small black-brown

spots. There is little difference between the eggs of the two species, save that those of the grey phalarope are considerably larger.

Gen. *Recurvirostra*, L.

Beak long, thin, smooth, flattened on the top, the outer half bent upwards; front toes joined by an indented membrane to the points; hind toe small, does not reach the ground; first wing feather longest; tail with twelve feathers; under coverts very long. Female resembles the male, but is smaller, with a shorter beak.

219. RECURVIROSTRA AVOCETTA, L. Skärflacka. The Avocet. D. F.

Length 18 in.; tail 3 in.; beak 3½ in.; tarsus 3¼ in.; the naked portion of the tibia 2 in.; ground colour pure white; crown of the head, nape of the neck, scapulars, and lesser wing coverts, black; beak black; iris brown; legs grey-blue. In the young the back is tinged with brown, and the shoulders edged with red-brown.

Rare in Scandinavia, and is seldom seen north of Gotland and Aland, where they are said to breed. Breed in many places in Denmark. Eggs three, scarcely so large as those of the golden plover, much resembling in colour those of the black-winged stilt, drab ground, covered all over with deep black spots. The black-winged stilt has been killed in Denmark.

ORDER 5.—NATATORES.

Legs short; toes webbed to the claws; feathers tight and downy; the male always the largest, and, in most cases the handsomest; moult twice in the year. Many—such as the geese, swans, and ducks—shed all their wing feathers at once, generally about the end of July, and for a fortnight or so cannot fly.

Fam. 1.—LONGIPENNES, Cuv.

Wings long and pointed; beak, hard, smooth (never

dentate); compressed at the sides, and pointed; front toes webbed.

Gen. *Sterna*, L. Terns.

Beak moderate, straight, slender, sharp pointed at the tip; mandibles equal; mental angle in the lower one very little projecting; nostrils small, pervious, basal; legs short; outer toe longer than the inner; membranes or webs deeply notched; wings long, acuminated, pointed; first feather longest; tail generally forked, often with the side feathers far projecting, as in the swallow.

In both the gulls and the terns the tail in the young bird is always even. May all be considered as summer migrants to the north, though many occasionally remain off the southern coast during the winter.

White or Sea Terns.

220. STERNA CASPIA, Pall. Skrän Tärna. The Caspian Tern. D. F.

The largest of all the European terns; beak large, thick, deep red; legs black; tarsus 1½ in.; tail not deeply cloven; length 22 in.; beak 2⅝ in., ⅞ in. high; tail 5½ in., much shorter than the wings.

Spring dress: whole of the head and back of the neck black; mantle pale ash-blue; wing feathers on the tips and inner fan slate-blue; sides of the head, breast, and under parts pure white; iris red-brown.

Winter dress: forehead white; neck spotted with black and white; the rest as in spring.

Young: spotted with brown; beak brownish.

Is a very local bird. A few pairs breed yearly on the Wener, and it has been killed as far north as Torneå, but is certainly rare in Sweden. Seems to breed commonly on the Isle of Sylt, in Denmark. Eggs three, considerably larger than those of the common gull, smooth, of a light drab colour, with large and small purple brown spots, strewed over the whole surface of the egg. The spots are wide apart, leaving the ground colour very apparent, and

giving the egg a lighter appearance than that of any other tern.

221. S. Cantiaca, Gm. Kentska Tärna. The Sandwich Tern. D. F.

Beak small, long, black, with a yellow tip; legs and feet black; tarsus $1\frac{1}{16}$ in.; tail deeply cleft, shorter than the wings; length 17 in.; the longest tail feathers 5 in.; beak from gape $2\frac{5}{8}$ in.; iris dark brown.

Summer: head black; mantle, wings, and tail ash-blue; all the under parts white; first wing feather black, with a white shaft, and a broad white inner edge; the rest more grey; the outer tail feather with a grey spot towards the point. In the winter the head is white, spotted with black. The young have a shorter, paler beak, and the head and back spotted; all the terns are subject to these changes in winter and young dress. Is certainly rare in the north.

222. S. Dougallii, Mont. Douglalls Tärna. The Roseate Tern. D.

Beak black, reddish yellow at the root; tail much longer than wings; legs yellow-red; middle toe longer than the tarsus, which is only $\frac{7}{8}$ in.; the outer fan of the first primary black; inner fan grey-white; outer fans in all the rest grey-white; length 17 in; tail $7\frac{1}{4}$ in.; head black; mantle light blue; tail white; under parts white, with a beautiful rosy tint on the breast.

Must be very rare in Scandinavia, although Yarrell states that Mr. Dann found it breeding in Lapland. I never saw the bird in Lapland, nor did I ever hear of any one who had seen it.

223. S. Hirundo, L. Fisk Tärna. The Common Tern. D. F.

Beak red, with a black tip; legs red; tarsus 6 l.; the grey streak on the inner fan of the first primary at $2\frac{1}{4}$ in. from the tip, 2 l. broad; head black; mantle and tail (which is deeply cleft, and of about the same length as the closed wings) light ash-blue; checks and

all the under parts white; length 16 in.; tail 6½ in.; beak from the gape 2⅝ in.; eye red-brown.

Is certainly the commonest tern on all these coasts; breeds far inland, for instance, on the Wener, and goes up far into Lapland.

224. S. Arctica, L. Rödnäbbad Tärna. The Arctic Tern. D. F.

Beak straight, altogether red (in the young it is yellowish); legs red (in the young orange red); tarsus ⅝ in.; the grey streak on the inner fan of the first primary 2½ in. from the tip; ⅛ in. broad; sides of the head and throat pale ash-grey, which colour is even deeper on the breast and under parts, and this will distinguish the arctic from the common tern at all seasons. Head in the summer black; the wings, mantle, and tail ash-blue, deeper than the breast and belly; tail cleft, a little longer than the closed wings, much resembles the last, but is a little slenderer and smaller; beak from the gape 1⅜ in.; the first primary has less ash-grey, and the tail is lighter grey than in the common tern.

It is singular that this tern has never yet been met with on the west, or north-west coasts of Scandinavia, although common on the Baltic. Is certainly the commonest of the terns in the heart of Lapland, and is the only species mentioned by Sommerfeldt in his list of the birds at Vardo, near the North Cape.

225. S. Minuta, L. Små Tärna. The Lesser Tern. D.

Beak yellow, with black tip; legs reddish yellow; tarsus ⅝ in.; the shafts of the two outer wing feathers black; tail white, 1 in. shorter than the closed wings, and cloven down one-third of its length; head and cheeks black; mantle, tail, and wings ash-blue; all the under parts white; forehead white; length 9 in.; tail 2½ in.; beak from the forehead 1 in.

Appears to be confined to the very south of Sweden, and no where common.

The gull-billed tern, *S. Anglica*, Mont, appears to breed in some parts of Denmark, but has never been identified in Scandinavia.

Black or Swamp Terns.

226. S. Nigra, Briss. Svart Tärna. The Black Tern. D. F.

Beak black; legs brown; wings and the tail, which is very little cloven, dark grey, with white shafts; tarsi 5½ in.; feet webs deeply indented; head and neck in summer black; all under parts ash grey; under tail coverts white. In the winter the head and neck white, with a spot over the root of the beak black; length 9½ in.; beak from forehead 1⅛ in.; tail goes 2 in. beyond the closed wings.

Is not common in Scandinavia, but is met with breeding on many of the swamps on the eastern coast as far up at least as Upland.

227. S. Leucoptera, Tem. Hvit-vingad Tärna. The White-winged Black Tern. D.

Much resembles the last in size, but the tail is shorter in proportion; beak and legs red; rump and under and upper tail coverts white; wings grey, with white shoulders; head, back, and breast black. In the winter the colours are paler.

Has been shot only once in South Sweden, and only seen once in Denmark, about the same time, probably the same bird.

The whiskered tern (*S. Leucopareia*, Natt.) has been obtained accidentally in Denmark.

Gen. *Larus*, L. Gulls.

Beak larger than in the terns and compressed laterally throughout its whole length; strong, straight, bent at the tip; under mandible shortest, with a large mental angle; nostrils pierced in the middle of the beak; legs large, naked over the knee; webs not so deeply indented as in the terns; wings not so pointed, with the first and second primaries

equal; tail always even with, or shorter than the wings. The tail and the beak will always distinguish the gulls from the terns.

The sexes do not differ in plumage, but the female is the smallest. They do not assume the full mature dress until the third or fourth year, when they are ready to breed. With the exception of the glaucous, Iceland, and ivory gulls, are chiefly summer migrants to the north, though many remain off the southern coasts all the year, and they are all seen off the North Cape in the winter.

A.—With black or brown head in summer, which, however, is always white in the winter. The immature dress is more or less spotted. Breed in fresh water.

228. LARUS MINUTUS, Pall. Dverg Måse. The Little Gull. D. F.

Tarsus and middle toe alike, 1 in.; primaries in the ends white; the shafts grey-brown; the claw of the hind toes very small and straight; mantle ash-blue; beak dull red; legs bright red; tail 1½ in. shorter than the closed wings; length 11 in.; beak ⅝ in.; rump and all the under parts white; sides in summer with a faint rosy tint.

Breeds in Gotland, and I believe in no other place in Scandinavia. Far more common around Novaga, Ladoga, and Archangel, in Russia.

In habits much resembles the black-headed gull, and the egg is of much the same shape and colour, but smaller; those I have seen measuring about $1\frac{1}{16} \times 1\frac{1}{4}$.

229. L. RIDIBUNDUS, L. Skratt Måse. The Black-headed Gull. D. F.

Tarsus 1⅝ in. longer than the middle toe; the outer wing feather white, with black tips and edges; mantle ash blue; tail 2½ in. shorter than the wings; length 16 in.; beak, from forehead, 1⅛ in.; beak and legs reddish.

Is very common in South Sweden; rare in Norway.

B.—With white head, both summer and winter, but in the winter the heads of some are spotted brown.

1.—With white back.

230. L. Eburneus, Gm. Hvit Måse. The Ivory Gull. D. F.

Length 20 in.; beak, from the nostrils, 6 l.; tarsus 1 in. 4½ l. shorter than the middle toe; foot web indented. The whole plumage ivory white, with black, rough, short legs; beak large, grey-blue, with yellow tip; the first primary longer than the following. The young bird has small black spots on the wings, thicker on the head; a black band at the point of the tail; beak blackish, with yellow tip.

Has never been detected breeding in any part of Scandinavia, but is only occasionally seen off the coast in the winter.

Morris gives a very good figure of the egg of the ivory gull. I have not seen many, and all these have been from Greenland. Ground colour reddish white, covered all over with large and small red-brown spots. I know no gull's egg so light in colour. Rather larger than that of the last.

2.—With ash blue back; both in summer and winter all the under parts white.

231. L. Trydactylus, L. Trotåig Måse. The Kittiwake. D. F.

The absence of the hind toe will distinguish this at once from any other gull. Mantle ash blue; tarsus 1$\frac{9}{10}$ in.; the outer primaries black, with white tips; bill green-yellow; legs dark olive green; length 18 in.; wings 2 in. longer than tail; beak from forehead 1$\frac{3}{4}$ in.

Except as accidental wanderers, they seem to be confined entirely to the Polar seas on these coasts.

232. L. Canus, L. Fisk Måse. The Common Gull. D. F.

Length 17½ in.; beak, from forehead, 1$\frac{3}{4}$ in.; the older the bird grows, the higher and more bent at the tip does the beak become; tail about 2 in. shorter

than the wings; first wing feather a little longer than second, which is much longer than the third, which is longer than the fourth; mantle ash blue; tarsus 2 in.; the first two primaries black, with a large white spot near the tips; beak green, with the tip yellow; iris grey; legs greenish yellow; in some, probably very old birds, the iris is brown, and the legs blueish.

Is the commonest of all the gulls, in the summer, on all the Scandinavian coasts.

There is a form of the common gull on these coasts, which some wish to make a distinct species, in which the six outer primaries are black, their shafts white in the middle. Nilsson calls this the hvit spolig (or white-shafted) gull.

233. L. Leucopterus, Fab. Hvit-vingad Trut. The Iceland Gull. D. F.

Length 20 to 22 in.; beak, from nostrils, 81.; tail 7 in., 2 in. shorter than the wings; the first wing feathers pale ash blue, with white shafts and long white tips; mantle pale ash blue; first wing feather longer than second; beak yellow, with a red spot on the angle of the under mandible; legs white flesh colour.

Resembles the herring gull, but the colour of the back is much paler, and the wing primaries are never black; in the young birds the wing feathers are tinged with grey-brown, and have dark spots behind the white tip.

Said to breed in East Finland, but is only an occasional visitant, generally in the winter, to the other Scandinavian coasts.

The egg is small for the size of the bird; smaller than that of the herring gull, which it often much resembles.

234. L. Argentatus, Brun. Grå Trut. The Herring Gull. D. F.

Mantle ash blue, darker than the last; the four first wing feathers black, with black shafts; the first with a long white tip, the second with a large round white spot at the back of the tip, which, as in the two

next, is white; beak much as in the last; legs pale grey; tail about 2 in. shorter than the wings; iris yellow-white; length about 2 ft.; beak, from the nostrils, 1 in.; first wing feather longest.

Is the commonest of all the gulls (next to the common gull) on all these coasts, right up to the North Cape, but does not, I think, breed in the South, although said to do so on Gotland.

But the Isle of Sylt in Denmark appears to be a great breeding place of these birds, for according to Kjärbölling 30,000 to 40,000 eggs have been sent away in one season from that island.

235. L. Glaucus, Brün. Stor Hvit vingad Trut. The Glaucous Gull. D. F.

The largest of all our gulls. Length 2 ft. 4—6 in.; beak from gape 4 in.; tail 8 in.; tarsus 3 in. Mantle ash blue. Wings scarcely longer than the tail; the first two primaries equal; all ash blue, with white shafts and tips. In the winter the head and neck have long grey-brown spots. Beak large, yellow, with a red spot on the large angle on the under mandible; eyes yellow; legs pale yellow-grey.

Is said to breed on the coasts of East Finland. Eggs two, seldom three; rather smaller than those of the great black-backed gull, and much like them, but the ground colour is lighter.

3.—With black back at all seasons; under parts white.

236. L. Marinus, L. Hafs Trut. The Great Black-backed Gull. D. F.

Mantle black; legs white; tarsus over 3 in.; wings longer than the tail by about 1 in.; the first wing feathers black, with white tips; shoulders and secondaries tipped with white; beak, wax yellow, with a red spot on the under mandible; iris yellow-grey; legs pearl grey; length about 28 in.; beak from gape 4 in.; tail 8 in.; tarsus $3\frac{2}{8}$ in. The winter dress is much the same, but streaked dark on the head and neck.

Breeds on most of these coasts as far up as the North Cape, but in the South is more common in the Baltic than in the Cattegat and North Sea. Breeds even sparingly on the Wener, as well as the next.

237. L. Fuscus, L. Sill Måse. The Lesser Black-backed Gull. D. F.

Mantle black; legs yellow; beak as in the last, but smaller; wings the same, but more than 2 in. longer than the tail; length about 21 in.; beak from the gape 3 in.; tarsus $2\frac{3}{8}$ in.; tail 6 in., rather rounded.

The difference in size between the sexes of this species is remarkable; the female is often two inches shorter than the male. Commoner than the last, and breeds as far up as the North Cape, as well as inland in the midland districts.

Gen. *Lestris*. Skuas.

Have much the character of the gulls, but the upper mandible of the beak is furnished with a membranous bony cere reaching from the base to about two-thirds of its length; at the end of this is placed the bent tip, which is distinct. Nostrils pierced just behind the tip; under mandible as in the gulls, but much more hooked; wings pointed, first feather longest; tail with twelve feathers, of which the two middle ones are always more or less lengthened.

Tail rounder, middle feathers projecting but little.

238. Lestris Catarrhactes, Ill. Stora Labben. The Common Skua. D. F.

The three middle tail feathers of an even breadth to the end; tarsus $2\frac{5}{8}$; the outer wing feathers from the root to the middle white, which forms a white spot on the dark wing. Length about 23 in. (in these species the length is reckoned to the ends of the feathers next to the middle pointed ones), and about the size of the herring gull; beak from gape $2\frac{5}{8}$ in.; middle tail feathers 6 in.; side feathers $5\frac{1}{4}$ in. Colour, dark brown,

with rusty feather shafts; under grey-brown; wings black, with a white spot (as the bird becomes older, the rusty tinge, especially on the sides of the head and breast, becomes deeper); beak and legs black; in the young pale blue; iris grey-brown in the young, in the older birds dark brown.

Is rare in the south of Scandinavia. Never seen in the Baltic or the Sound, but more common on the west coast of Norway.

239. L. Pomarina, Tem. Bredstjertade Labben. The Pomarine Skua. D. F.

Tail nearly even at the end, 5 in. 4 l. long; the middle tail feathers broad, even to the tip; tarsus $2\frac{1}{8}$, as long as the middle toe with claw; wing brown, never with a white spot. Length about 18 in.; beak $1\frac{1}{4}$ in. at the root, 5 l. high, and 4 l. broad; wing feathers black, the front ones with white shafts, and the inner fan white at the root; iris dark brown; beak blueish, with a black tip; cere greenish; legs and toes in the old birds black, in the young blue-grey. In the full summer dress the neck, breast, and middle of the belly are pale yellowish white, the first with smaller, the latter, especially on the sides, with broad dark transverse bands; crown of the head and mantle uniform dark brown; neck and throat feathers shiny gold yellow; across the breast a band of brown spots. The young birds have rusty feather edges on the mantle and head; neck brown, with a rusty tinge; under parts grey-brown, with irregular rusty yellow wavy spots.

In the summer is rarely seen on the Scandinavian coasts below the Polar circle. Breeds on the coast of Finmark, but is nowhere so common as the next. Late in autumn, however, is occasionally seen in the Cattegat and Baltic.

I consider this egg one of the rarest to obtain. I have, I believe, authentic specimens from Greenland. The eggs of all the skuas have much the same appearance; pale olive green or yellowish grey ground colour, irregularly blotched and spotted with two shades of reddish brown. That of the

common skua is at once known by its size, being as long, and generally thicker, than that of the lesser black-backed gull. The eggs of the other three are, however, difficult to distinguish. They all vary much in size, shape, and colouring; but if a lot could be mixed without marking them, it would be almost impossible to separate them. As far as I have observed, the egg of the pomarine is usually thinner and more pointed at the smaller end than the other two. But I can hardly see any difference between the eggs of Richardson's and Buffon's skua, except that perhaps that of the latter is rather thicker and blunter at the large end, and usually greener in colour, especially when first taken. Respecting the breeding habits of the skuas in East Finland, Sommerfeldt observes—"The pomarine skua breeds inland, a little way from the coast; Richardson's skua, on certain islands in the sea, and on some tolerably dry places on the mainland, but does not come far into Waranger Fjord. Buffon's skua breeds on the marshes near the fjord, and also on the fell mosses by the side of the large Tana River."

The middle feathers of the tail elongated and pointed.

240. L. Parasitica, Boie. Spetsstjertade Labben. Richardson's Skua. D. F.

The two middle tail feathers pointed, about 3 inches longer than the others; middle toe, with claw, equal to tarsus, 1 in. 6 l.; the front edge of the nostril is much nearer to the tip of the beak, than to the point of the feathers on the sides of the beak. Length 1 ft. 5 in.; the side feathers of the tail 4½ in.; the next to them 5 in.; the middle ones about 8 in.; beak from gape 2 in.; height at the root ½ in.; breadth a little more; horn coloured, with a green tinge; legs and feet black; iris brown; mouth, tongue, and gape, white; legs in the young, lead coloured, toes at their bases white; old bird, mantle dark brown, becomes blue-grey with age; head and neck blackish; wing feathers and tail white at the roots; temples, throat, a ring round the neck, as well

as the under parts, white, with a golden tint on the sides of the neck and head; under tail coverts and thighs brown-grey. The colour, however, varies. The young bird in all the species may be known by the rusty yellow wavy lines on the upper plumage, the grey-white and black-brown transverse bars on the under parts, and, in this and the next, by the nearly even tail.

Is the commonest of the species on these coasts, but I do not believe either it or the pomarine skua go far inland to breed, like Buffon's.

241. L. Buffonii, Boie. Fjäll Labben. Buffon's Skua. D. F.

The two middle tail feathers very long and pointed, as in the long-tailed duck, 12 to 13 in. long, and in very old birds will often extend from 6 to 7 in. beyond the others. Middle toe 1¼ in., much shorter than tarsus. The front edge of the nostrils lies exactly between the tip of the beak, and the edge of the feathers at its base. Length to the end of the side tail feathers 15 in.; beak from the forehead 1 in. 1 l., green-brown, black tip; iris brown; tarsus lead grey; web black. Head and neck glossy black; throat white, with a yellow tinge on the sides, in front white; breast ash grey, which becomes darker on the belly and under the rump; back and shoulders brown-grey, tinged with ash blue, sometimes altogether ash blue; primaries black, with white shafts on the three first; tail feathers same as the back, but with black tips. The sexes do not differ the least in plumage.

Although occasionally seen accidentally in other parts of Scandinavia, the peculiar breeding home of the Buffon's skua is on the Lapland fells. They are not always seen in the same numbers every year, and they say (although I fancy this is not correct, for I never but once found the remains of a lemming in one of these birds) that it is the migrations of the lemmings which draw them down to

certain localities. One thing, however, is certain, that in 1862, we had a migration of lemmings at Quickiock, and that year in one fell meadow, a little distance from the village I shot about twenty-five old birds, and procured above thirty eggs. I got the first nest on June 3rd. I never but once found more than two eggs in a nest; the nest is nothing more than a few pieces of dry hay scratched together on the ground, generally near water, never on the real snow fells. Although they breed in colonies, I never found two nests close together. In the young birds just flyers, the plumage much resembled that of the common skua, and the tail was perfectly even.

Gen. *Procellaria*, L.

Much resemble the gulls; the beak, which is as long as the head, is in shape more like that of the skua, but the nail or hook on the end is much more developed, and the nostrils form a single tube, which opens out in the middle of the upper mandible; wings long, first feather longest; tail rounded, or wedge shaped, fourteen feathers; the sexes do not differ in plumage, and the young are more grey, but much resemble the old birds.

242. PROCELLARIA GLACIALIS, L. Storm Fogel. The Fulmar Petrel. D. F.

Ash blue above, with dark wings; below white; point of the beak, legs, and feet, yellowish; eye brown, becomes yellow with age; primaries dark grey; beak 1 in. 4 l. long at the root, thick and round, 6½ l. high and the same broad; about the size of the common gull; length 18 in.; tail 5 in. shorter than the wings; tarsus 2 in.; nasal tube 3⅔ l. broad.

Is not seen on the Swedish coasts in summer, but occasionally in autumn and winter. Never further south on the Norwegian coast than Trondtheim. Breeds in the far North in the islands off Norrland and Finland, but Iceland appears to be the principal breeding place of the fulmar petrel. The female lays one white egg, without any nest; 3 in. long, 2 in. broad.

Gen. *Puffinus*, Ray.

Beak like the last, but longer and not so thick; the nasal tube is double, and does not extend nearly so far along the back of the upper mandible as in the last; in both the hind toe is nothing more than a small pointed claw; tail with twelve feathers; colour dark brown.

243. PUFFINUS ANGLORUM, Ray. Mindre Liran. Manx Shearwater. D.

Upper parts black in the old birds, brown-grey in the young; under parts white; tail rounded, about equal with wings; length 14 in.; beak, from the forehead 1 in 4 l.; tarsus 1 in. 6 l.; beak black; legs black-brown; web flesh-coloured; eye brown.

Is only accidental in these seas.

244. P. MAJOR, Fab. Större Liran. The Greater Shearwater.

Grey-brown above, much lighter than in the last; below white; tail rounded; length 20 in.; beak, from forehead, 1 in. 7 l.; tarsus 2 in. 2 l.

There is a great question if this bird can be included in the Scandinavian fauna; at any rate it is only very accidental.

Gen. *Thalassidroma*, Vig.

Beak very thin, shorter than the head; of the same form as the last; nasal tube single; wings long; second feather longest; tail with twelve feathers; the smallest web-footed birds in the world; principal colour black.

245. THALASSIDROMA PELAGICA, Vig. Lilla Storm Svala. The Stormy Petrel. D.

Black all over, with a white rump; tail square; sometimes a whitish streak on the wings; length 6 in; beak, from the gape, 4 l.; tail ½ in. shorter than the wings; beak, legs, and claws, black.

I do not think it has been detected breeding on any

of these coasts, but many assemble in the winter off the north-west coast of Norway. Only accidental in the South.

246. T. Leachii, Tem. Klystjertad Storm Svala. Leach's Petrel. D.

Like the last, but the wing coverts are brown-grey; length 8 in., and the tail is deeply cloven, 5 l. shorter than the wings; the longest feather in the tail 3 in.; beak, from gape, 7 l.; nasal tube does not reach half way down the beak; hinder back, rump, and sides white. Is said to have been once killed in Norway.

Wilson's petrel, which is about the size of the last, but with a square tail, much shorter than wings, and has an oblong yellow patch on each of the webs between the toes, has never been identified, nor has Bulwer's petrel, in any of these seas.

Fam. 2.—Lamellirostres, Cuv.

Beak various; both mandibles armed with lamellæ or with small denticulations; front toes wholly webbed; hind toe placed high, not webbed.

Gen. *Cygnus*, Bechst. Swans.

Beak longer than the head; the nail on the top of its tip does not occupy the whole of the point of the beak; nostrils pierced through, placed in the middle of the beak; tract between the beak and the eyes in the old birds naked; neck thin, as long or longer than the whole body; second and third wing feathers longest.

The swans differ from the geese in that the beak is longer than the head; sides of the cheek bare; tarsus shorter than the middle toe, and neck as long as the whole body. The young do not attain their full white plumage till the third year, before which time they are greyish blue. Like the ducks, they are monogamous.

247. Cygnus musicus, Bechst. Sång Svan. The Wild Swan. D. F.

The whole of the body colour white; bill black, longer than the head, bright yellow at the base and

sides to beyond the nostrils, then black; no knob at the root of the beak, as in the nest; the lamellæ in the beak not visible when it is closed; length 4 ft. 9 in.; weight 22 to 26 lb.; head, neck, and beak 2 ft. 5 in.; beak from forehead 4 in. 4 l.; tail rounded, with twenty feathers, 3½ in. longer than wings; tarsus 4 in. 6 l.

Is only seen in the southern and midland districts during the periods of migration. Breeds up in Lapland, generally in the retired fell lakes. Eggs seven, brown-yellow, rather shorter and thicker than those of the common swan.

Many wild as well as tame swans remain in the Sound, off the southern coast of Sweden during mild winters; but none of them or geese are seen off the north coast of Finland at this season.

248. C. Minor, Keys and Blas. Mindre Sång Svan. Bewick's Swan. D.

Beak black, at the root yellow, which colour, however, does not extend to the nostrils, same length as the head; tail feathers eighteen to twenty; colour as in last; length never exceeding 4 ft.; the principal difference, however, is found, upon dissection, between the shapes of the windpipes of the two species.

Has been once killed in Norway and once in Denmark, and probably overlooked in Sweden.

249. C. Olor, Veill. Tam Svan. The Mute Swan. D. F.

The forehead furnished with a horny knob, which, as well as the tract between the eyes and beak, and the oblong nail at the end of the beak, are black, rest of the beak yellow-red; tail sharp, about the same size as the last, but the body is not so thick or heavy; legs black in all the swans.

That the tame swan breeds in a wild state in some places on the south-east coast of Sweden is pretty certain, but it does not appear to be met with in Lapland or Norway. It has always been a mystery to me where the large flocks of these swans come from, which assemble after the breeding season on the southern coasts of Sweden, and furnish game

for a swan-hopping on a large scale, off Falsterbo, about the 8th of August. I cannot think that they are all bred here, and it appears singular that they should migrate north from more easterly lands. Are the tame swans ever seen in a wild state off the British coasts in winter?

Gen. *Anser.*, Briss. Geese.

Beak shorter than the head; nail occupies the whole point of the beak; nostrils oblong; neck shorter than the body; the windpipe is single; sexes exactly alike in plumage. They moult once in the year, and the summer plumage is like that of winter; side lamellæ in the beak apparent.

1.—*Anser.*

Beak as long as head.

250. Anser cinereus, Mey. Grå Gås. The Grey Lag Goose. D. F.

Beak large and thick, reddish yellow, with a whitish nail; legs pale flesh-colour; the closed wings 1 in. shorter than the tail; length 2 ft. 9 in.; tarsus 3⅜ in.; beak from forehead 3 in. at the root, 1¼ in. high, 1¼ in. broad; colour above ash grey; breast paler; upper and under tail coverts, as well as the rump, white.

I never could find out exactly where the common wild goose bred in Scandinavia, but it certainly does not go up to breed in Lapland. Sommerfeldt, however, says they breed off Tromsoe, on the north-west coast of Norway. A few may, but my opinion is, that most of them breed in the eastern districts, for I have obtained the egg more than once there, but I never could, during the breeding season, hear of or see the bird in Lapland, or near us in the middle of Sweden.

251. A. Segetum, Gnab. Säd Gås. The Bean Goose.

Beak long, black, with a yellow band (paler but apparent in the young birds) on the upper mandible just behind the nail; legs reddish yellow; wings gene-

rally longer than the tail; head dark brown; colour much as in the last, but generally a little browner; length 3 ft. 2 in.; weight 8 lb.; beak 2⅞ in. long at the root, 1 in. 3 l. high, 1 in. 1 l. broad; tail 6 in., eighteen feathers, all with white edges.

Breeds up in Lapland, not on the high fells, but in the forest lakes, on which account it is called there the "skogs (or forest) gas;" egg pure white, 3⅛ in. long by 2¼ in. broad.

252. A. Albifrons, Bechst. Bläs Gås. The White-fronted Goose. D. F.

Beak pale flesh-coloured, with a large white nail at the end; legs yellow; neck and head brown; a large patch of white in the old birds, on the forehead and root of the beak, which is wanting in the young; the outer and under wing feathers pure ash grey; hinder parts of the back and rump blackish grey, unspotted; under tail coverts white. In the old bird the breast is marked with deep, black, large transverse spots; in the young bird these are wanting, and the breast is only blackish grey; length 28 in.; beak 1 in. 6 l. long, 1 in. high at root; tail about equal to the closed wings, 5 in.; beak short, and in form like that of the common wild goose; tarsus 2½ in. The young bird is generally 4 in. shorter than the old.

That this goose has for a long time been confounded with the next is pretty certain. Nilsson says this is the true fell goose of Scandinavia. This is quite wrong. It is not known to the Laps, nor do I believe, except accidentally, this species is ever met with in Scandinavia. I do not think they breed in this country.

253. A. Minutus, Naum. Dvorg Gås. Fjäll Gås. D. F.

The same description will pretty well suffice for both these species, so much do they resemble each other, but they are very different in size. The beak of *A. minutus* is much smaller, and the upper lamillæ, which

are very apparent in *albifrons*, are in *minutus* very small, and cannot be seen when the beak is closed. Legs red; beak rosy red, with a brown nail; all the primaries have white shafts; the second longest, first and third alike, and a little shorter; tail sixteen feathers, length 22 in.; beak from forehead 1 in. 2 l., 6 l. high, and 6 l. broad; tarsus 2 in. 4 l.

This is the common fell goose of Sweden, and the only one which breeds on the Lap fells. Both the bean and this goose breed in Lapland, and they are the only two that do so in the interior of the country; but the bean goose, as I have before remarked, never breeds on the fells. The Lap name for this goose is "kasak," on account of its peculiar cry. The egg is ivory white when clean (but I have observed that they are generally very dirty), 2¼ in. long by 1⅞ in.

Well figured by Dr. Bree as "the little white-fronted goose."

2.—*Bernicla.*

Beak shorter than head; lamellæ not apparent when the beak is closed.

254. A. Leucopsis, Bechst. Hvit Kinkad Gås. The Bernicle Goose. D. F.

Beak and legs black; forehead, sides of the head, and throat white; crown of the head and neck black; mantle ash blue, with blackish spots; shoulders and back, rump and tail black; belly, breast, upper and under tail coverts white; length 2 ft.; beak 1 in. 1 l.; tarsus 2 in. 4 l.; tail 4 in. 4 l., equal with the closed wings; sixteen tail feathers.

Only a bird of passage through Scandinavia, to and from their breeding haunts, either in Spitzbergen, Greenland, or on the shores of the White Sea. The egg much resembles that of the last, but is smaller. I have received them from Greenland, never from Scandinavia, nor do I fancy it breeds in this country.

255. A. Torquatus, Ill. Prut Gås. The Brent Goose. D. F.

Head and neck and breast black; no white on any part except the upper and under tail coverts, and a little white patch on the upper side of the neck; back and shoulders black-grey; tail and wings black; belly, upper and under tail coverts pure white; beak and legs black; iris deep brown; tail sixteen feathers, round, equal to the closed wings; weight about 5 lb. The young have head and neck ash grey, with no white spots; length 2 ft. 1 in.; beak 1 in. 3 l.; tarsus 2 in. 2 l.

I do not believe this goose breeds in Scandinavia, except perhaps on the north-west coast of Norway, but in Spitzbergen and Greenland it is common during the summer. The egg much resembles the last, but is smaller, light ivory yellow, smooth, very little larger than that of the sheldrake. Sommerfeldt, however, says that both this, *A. cinereus*, and *A. arvensis* all breed here and there around Tamsoe, but the barnicle never.

256. A. Ruficollis, Pall. Rödhalsad Gås. The Red-breasted Goose. D. F.

Crown of the head, breast, throat, cheeks, neck, back, glossy black; a large white patch between the beak and the eye, and a brown-red patch encircled by white on the sides of the head; lower neck and upper breast brown-red, with a white ring below; belly, under and upper tail coverts pure white; length 22 in.; tail 4 in.; beak 1 in.; beak black; legs black-green; eye brown.

Only a very accidental visitant to Scandinavia. Breeds in Siberia and North Russia. Egg dirty grey-white, with a kind of belt round the middle, of indistinct, confused dirty yellow-brown spots; scarcely so large as the egg of the brent, and more pointed. I may add that I never saw but two of these eggs; these, however, were genuine, and from Siberia. *A. arvensis*, Brehm, which is, I believe, nothing more than a variety of the bean goose, and *A. hyperboreus*, Pall., the snow goose, are both added to the Danish fauna.

Anatinæ. Ducks.

Gen. *Anas*, L.

Legs placed under the middle of the body; tarsus round, about as long as middle toe; beak the length of the head, of an even breadth throughout, high at the root, sometimes broader at the tip; a nail on the tip, and the upper mandible furnished with lamellæ visible at the sides; nostrils placed in a small nasal furrow, much nearer the base of the beak than its tip, and near the top ridge of the beak; wings pointed, first and second wing feathers longest; wing speculum with a metallic gloss; hind toe bare, without lobe.

The species belonging to this division are not true diving ducks, like the *Fuligulæ*. They are generally larger, the males handsomer, and they live principally in fresh water during the whole year. Little difference between the summer and winter plumage, except for about two months, in July and August, when the male assumes a dull plumage like the female. Are all summer migrants to the North.

257. ANAS TADORNA, L. Graf And. The Sheldrake. D. F.

Variegated white-black and brown-red; wing speculum green, fringed above with a brown-red band; beak red, with a large knob on the base in the breeding season; legs red, or in the young red-grey; head green; neck white; breast red-yellow; shoulders black; back, sides of the breast, and belly, pure white; tail white, with a black tip. Little difference in the plumage of the sexes, but the female is smallest, and never has a knob on the beak.

As the duck's eggs are often difficult to distinguish, I shall try and describe them as well as I can, from authentic specimens in my own collection.

The sheldrake breeds, as far as I know, only in the south of Sweden. I cannot say whether it is met with on the south-west coast of Norway. It certainly does not go up within the Polar circle, and in the Baltic no higher than Kalmar Land, in Swedon. A specimen however, according to Nordvi, has been shot in Waranger Fjord, near the North

Cape. Egg large, cream white, about 2½ in. long by 2 in. broad.

258. A. Rutila, Pall. Rödgul And. The Ruddy Sheldrake. D.

Whole body colour red-yellow; head yellow-white; tail and rump glossy black; the male has a broad black collar round the neck; wing speculum green, with a great white patch on the front wing; beak and legs black. Length 22 in.; tarsus 2 in. 2 l; beak from forehead 1 in. 6 l.; tail with fourteen feathers.

Egg exactly like the last, but a little blunter and smaller. These two eggs are the most white ivory-like of any of the ducks' eggs.

Only very accidental in Scandinavia. The eastern tracts of Europe are its native home.

259. A. Clypeata, L. Sked And. The Shoveller. D. F.

Beak long, broad at the end like a spoon; head and neck glossy green; back brown; belly and abdomen brown-red; lesser wing coverts pale blue; top of the breast white; scapular long, pale blue, glossy; speculum green, bordered in front with white and pale blue; beak black; legs yellowish. Female much resembles the female wild duck, but may always be known by the beak. Length 20 in.; beak 2⅝ in.; tarsus 1⅓ in.; eye yellow.

Is, I consider, a very rare duck in Scandinavia, and one which I never met with. Is said to breed at Quickiock, and even up at Happaranda. I did hear that a specimen had once been killed at Quickiock, but I never heard that it bred there.

The egg is something the colour of that of the common wild duck, but a little blunter than that of the widgeon, and no larger.

260. A. Boschas, L. Gräs And. The Common Wild Duck.

Head and neck glossy dark green, a white cravat round the neck; back grey-brown, with darker streaks;

shoulders grey-white, watered with black; wing feathers dark grey; speculum large, violet green on both sides, fringed with black and white; upper breast dark chestnut brown; the rest of the under plumage finely watered with black, on a grey-white ground; rump and the four crooked tail feathers, which are peculiar to the mallard, black. This is the plumage of the mallard during the whole year, except about the months of July and August, when he lays aside his fine livery, and then rather resembles the female, whose dress at all times is pale reddish grey-brown, with black transverse and long streaks, and a much less brilliant speculum. Beak in male yellow-green; legs orange-red. In female, beak greenish grey. The young resemble the female, and the young males may be known from the females by the black back, without the rusty brown feather edges.

Commonest of all the ducks throughout the whole of Scandinavia during the breeding season. Egg 2 in. 3 l. long, 1½ in. broad; light clay green. The weight of a good mallard here will be 4½ lb.; of a wild duck, scarcely 3½ lb.

261. A. ACUTA, L. Stjert And. The Pintail. D. F.

Length 2 ft.; tarsus 1 in. 6 l.; beak 2 in. 2 l. long, 5½ broad. Male, except just during the summer, when they resemble the females, head and neck dark purple brown; a white stripe down the sides of the neck, which is longer and slenderer than in any other duck; breast white; the middle and sides finely watered with grey and white; back wavy grey; scapulars long and fine, velvet black, with white edges; tail long and pointed, 7 in., extending 5 in. beyond the closed wings; the middle feathers black; speculum green; purple and grey-brown, in front with a rusty red, behind with black and white, bands; beak long and small, lead-coloured; legs black-grey. The female is brown-black above, covered with dark wavy streaks; under parts yellowish, with brown and white transverse bands; tail pointed, but the two middle feathers scarcely longer than the others.

Is confined in the breeding season to Lapland, where it is far commoner than the last. I always used to find the nest very early in June, in the small willow shrubberies that skirt the very foot of the fells. The egg of the pintail resembles that of the long-tailed duck, being much about the same size, and of a yellowish green clay colour; but they breed at very different seasons and in very different localities.

262. A. STREPERA, L. Snatter And. The Gadwall. D. F.

Length 20 in.; beak 2 in.; breadth at root 5 l.; tarsus 1 in. 4 l.; wing speculum white; legs yellow; beak long, of an even breadth, with long overhanging lamellæ; black in the young and female; yellow on the sides; head and neck rusty black-brown; breast black, watered with white; back, shoulders, sides, and under rump, black and white, finely watered; upper and under tail coverts white; a red patch on the shoulder; tail grey; under breast and belly white. The female is dark brown above, with rusty feather edges; under parts rusty brown, with small black spots. The male during the summer resembles the female.

Is one of the rarest of the Scandinavian ducks, and never met with in the north of the country. More common in Denmark. The egg of the gadwall is usually a little less than that of the common wild duck; greenish grey.

263. A. PENELOPE, L. Bläs And. The Widgeon. D. F.

Beak small; speculum green, fringed above with white, forming a white patch on the shoulder. Length 20 in.; tail 3 in. 6 l.; tarsus 1 in. 4 l.; beak 1 in. 4 l. long, 4¼ l. broad at the root, 5½ l. high; nail large and oval. The male is one of the handsomest of our ducks; beak and legs blueish; forehead and crown of the head yellow-white; rest of the head and neck red; back and shoulders finely watered with black and white; wing coverts long, white, with black edges; breast pale rose red; under parts white; tail black. The female is rusty

brown spotted above, with a blackish speculum; under parts dull silvery white.

Is one of the commonest of all the northern ducks, and breeds in almost all the still waters to far up within the Polar circle. Eggs clear yellow-white, about $2\frac{2}{8}$ in. long, $1\frac{4}{8}$ in. broad.

264. A. QUERQUEDULA, L. Arta. The Gargâney. D. F.

A dark-looking little duck. Speculum dull grey-green; shafts of all the wing feathers white; nail on the beak large, oval, 2 l. broad; a white stripe from the eye down the side of the neck. Length 16 in.; tail $2\frac{1}{2}$ in.; beak 1 in. 5 l.; tarsus 1 in. 1 l.; head and back black-brown; scapular long, dark green, with a white band down the middle; sides and under parts grey watered; beak black; legs brown; eye pale brown. The female much smaller; upper parts black-brown, with a rusty tinge; under parts rusty white; scapulars brown.

Is rare in Scandinavia; and although, according to Wright, has been seen up at Tornea, is decidedly a southern species. Egg exactly like that of the teal, but larger, $2\frac{1}{8}$ in. by $1\frac{1}{8}$ in.

265. A. CRECCA, L. Krick And. The Teal. D. F.

Wing speculum green, edged with black and white; all the wing feathers with black shafts; beak nail 1 l. broad. Length 15 in.; beak 1 in. 5 l.; tarsus 1 in. 1 l.; head red, with a green patch on the sides and two white streaks; back and sides handsomely watered with black and white; breast rusty yellow spotted; wing coverts brown ash grey; wing feathers dark; tail ash grey. Female, upper parts black, edged with rusty grey; under parts dull white, unspotted; young like the female; beak blackish; legs grey; iris brown. Eggs clear yellow-white, $1\frac{7}{8}$ long by $1\frac{3}{8}$ broad.

Is very common in the summer, and breeds in all parts, from the very south of Scania to far up within the Polar circle.

The bimaculated duck is said to have been once observed in Denmark.

Fuligula, Bp. Diving Ducks.

Hind toe furnished with a tolerably large lobe; beak about the length of the head, as high as it is broad at the root; nostrils placed in the middle of the beak; tail with twelve to eighteen stiff feathers; speculum white or grey, rarely coloured as in the last; body thicker and shorter than in the other ducks; head thick, generally with more or less bushy feathers. The winter and summer dress not the same. All breed in fresh water, but, except in the breeding season, are generally in the sea.

Subgen. 1.—*Fuligula*, Proper.

Bill as long as the head, broad; nostrils small, a little before the base; lamellæ not projecting.

266. FULIGULA CRISTATA, Steph. Vig-gen. The Crested Duck. D. F.

Beak at the root 4⅓ l. broad; tarsus 1 in. 3 l. (longer than half the middle toe). The male has a small pointed crest at the back of the head. Length 17 in.; beak 1 in. 7 l.; tail 2 in. 2 l. Male, head, throat, and breast, glossy black, with a green tint; belly white; the rest of the body, except the white speculum, blackish brown, with a green gloss. Male and female, during the summer moult, have the colours all duller, tinged with grey; belly tinged with rusty brown; the crest is shorter. The young may be known by the short crest, the brown-yellow iris (which is bright yellow in the old birds), a white cheek spot, and the general plumage being black or grey-brown.

I never could detect this bird breeding even so far south as Quickiock, but it does so commonly in Munio Lapland. Egg rather smaller than that of the pochard, which it much resembles in colour, dark grey-brown.

267. F. Marila, Schl. Hvit Buk. The Scaup. D. F.

Beak large and blue, $\frac{6}{8}$ in. broad at root, becomes much broader at the end; tarsus equal to half the middle toe; no crest. Length 21 in.; tail 2 in. 4 l., extending 1 in. 4 l. beyond the wings; beak 2 in. 1 l.; tarsus 1 in. 4 l.; eye small (as it is in all this group), bright yellow; beak pale blue, with large nail; legs grey; nostrils placed in the basal third divisions of the beak, which is 1 in. broad at the tip. Male, head bushy black, with green gloss; neck, breast, rump, upper and under tail coverts, glossy black; back and shoulders grey, watered with black zig-zag lines; all the under parts white. Female smaller; a broad white band round the root of the beak; head black; breast brown; upper parts dark brown; on the sides and shoulders watered with white; under parts white; beak lead coloured. The young bird may be known by the rusty brown tint over the whole body; otherwise much resembles the female.

Does not breed south of Lapland. Very common at Quickiock, in the lowlands and fell meadows. The egg much resembles that of the pintail in colour, but is larger and thicker, $2\frac{5}{8}$ in. by $1\frac{1}{4}$ in.

268. F. Ferina, Schl. Rödhalsad Dykand. The Pochard. D.

Speculum ash grey; tarsus 1 in. $2\frac{1}{4}$ l., like the middle toe; beak in male black, with a pale blue band over the middle; in the female the band is lead coloured, with a black nail; and in the young birds the band is very indistinct; iris red; head and neck chestnut; lower neck and breast black; back and shoulders pale grey, watered; primaries brown-grey at the base; upper tail coverts and tail black; belly pale grey, watered; legs blue-grey. The female has the head dusky brown; back much darker than male; breast ash brown; belly grey.

Is certainly one of the rarest ducks in the North, but has been occasionally killed in Norway, and even as far north as Karesuando Lapland. Does not breed in Scandi-

navia. Egg the size of that of the common wild duck, but of a deeper brown.

The ferruginous duck (*F. Nyroca*, Steph.), the white-headed duck (*F. Mersa*, Degl.), and the red-crested pochard (*F. Rufina*, Steph.) have been accidentally killed in Denmark, but not one of the *Fuligula*, except the eider duck, breeds in that country.

Subgen. 2.—*Oidemia*, Flem.

Beak large and broad (in the male swollen at the root); nail very large, covers the whole point of the beak; lamellæ coarse; nostrils not so far as the middle of the beak.

269. Oidemia fusca, Steph. Sjö Orre. The Velvet Scoter. D. F.

Wing speculum white; legs and toes red; whole body plumage in male black, in female brown; eye white. Length 23 in.; tail 3 in. 2 l.; beak 2 in. long, 1 in 2 l. broad; tarsus 1 in. 6 l.; middle toe 3 in. 2 l.; beak yellow on the sides in the male, but altogether brown in the female.

Breeds only on the Lap fells. I could never find the nest of this species in Quickiock, Lapland, although I often saw them in the breeding season. Contrary to the habits of the common scoter, this duck leaves the lowlands to breed high up on the fell lakes. The egg is very like that of the common scoter, but more ivory white and larger, $2\frac{7}{8}$ in. by 2 in.

It receives its Swedish name from the white wing speculum, as in the "orre" or black cock.

270. O. Nigra, Steph. Svarta. The Common Scoter. D. F.

No wing speculum; beak in male black, yellow only on the top; in female brown; male body colour all black; female all brown; head in male with a purple tinge; eye brown. Length 21 in.; wings short, reach scarcely over the tail root; tail 4 in.; beak from forehead 2 in., $\frac{7}{8}$ in. broad; tarsus $1\frac{6}{8}$ in.

Is certainly not so rare as the last in Scandinavia. We

found them breeding commonly in all the low meadows round Quickiock. The egg hardly so clear in colour as that of the last, $2\frac{5}{8}$ in. by $1\frac{7}{8}$ in.

271. O. PERSPICILLATA, Steph. Hvit nackad Svärta. The Surf Scoter.

This North American species so closely resembles the last in size, absence of the wing speculum, etc., that it may almost be doubted whether it is anything more than a local form of the common scoter. The beak in the male is yellow-red, with a square patch of black on either side; irides cream white; a patch of white on the crown of the head, and another on the back of the neck; the whole of the body plumage black. The female has a dusky bill, and the whole body plumage brown.

One specimen shot in 1836 at Karesuando, Lapland.

Subgen. 3.—*Clangula.*

Beak small, elevated at the base, much more contracted than in the *Fuligulæ;* lamellæ not projecting; nostrils in the middle of the beak; tail pointed; nail occupies the greatest part of the beak point.

272. CLANGULA VULGARIS, Leach. Knip And. The Golden Eye. D. F.

Male, wing speculum white; nail occupies one-third of the beak point; beak black; nostrils nearer the tip than the base; head bushy in male, glossy green; in female brown, with a white ring round the neck. Male, round white spot in the front of the eye; back and tertials black; the long scapulars white, edged with black; all the under parts white. In the female, upper parts are dusky; breast grey; under parts white; and the white on the wings less clear. Eye in both yellow; beak blackish, occasionally the female has a yellow band round the black nail. Birds of the year differ from the female only in having the back more brown and the breast not so white.

Is certainly commoner than any of the diving ducks in Scandinavia, and breeds (never, that I could find, on the ground, but always in holes of trees, or tubs set up for the purpose) from North Wermland up to the North Cape. The egg varies much in colour and size; generally larger and thicker than that of the common wild duck, of a pure blueish green colour; very handsome when fresh.

273. CLANGULA BARROWI, Rich. Barrow's Dyk And. F.

Precisely resembles the last, but is rather larger The wing speculum is divided by a black band; the nail occupies two-thirds of the point of the beak, and the spot on the side of the head in the male is larger and in the form of a crescent. The female resembles the female of the last, but the beak, as in the male, is narrower and shorter.

Is common in Iceland, and has once been killed in East Finland. Figured by Dr. Bree as the "Arctic garrot."

274. CLANGULA (SOMATERIA?) DISPAR, Yarr. Alförrädare. Steller's Western Duck. D. F.

Nilsson places this species here, but I do not think it belongs to this group. Nail occupies the whole of the beak point; nostrils nearer the root than the tip; tarsus 1 in. 3 l.; a white streak behind, and a large white spot in front of the blue-black speculum. About as large as the long-tailed duck, but the tail is only $3\frac{1}{2}$ in. long, although sharp pointed; head bushy in the male; white, with a green spot on the top, and a smaller one in front of the eye; chin black; a black ring round the neck; back black; belly and under rump black; breast, and all the rest of the under parts, light chestnut brown; scapulars long and fine black, blue, and white. In the female the head is dark brown; back and shoulders rusty black-brown; breast red-brown; wings black-grey, with a white streak on each side of the blue speculum.

Only accidental in the other parts of Scandinavia, but appears to remain during the whole year off Waranger Fjord,

near the North Cape, where they most probably breed. I never saw nor heard of an authentic egg taken in Scandinavia.

275. Clangula Histrionica, Flem. Ström And. The Harlequin Duck. D.

One of the most beautiful of all the diving ducks; beak shorter than tarsus, small; no white band behind the blue speculum; nostrils basal; iris brown; legs blackish. The chief colour in the male is slate blue; head violet black, with a large three-cornered white spot on each side, behind the root of the beak; two white cravats; rusty red on the body sides, and a large white shoulder spot. Female, grey-brown with a white spot under the eye, and on the ear; wing speculum not apparent; middle of the breast whitish; length about 18 in.; tail 3 in.; beak 1 in. 2 l. long, 6 l. high at the root, and 4½ l. broad; 3 in. broad at the tip; tarsus 1 in. 4 l.

The egg much resembles that of the long-tailed duck, but is rather longer, and more yellowish white.

276. C. Glacialis, Boie. Alfogel. The Long-tailed Duck. D. F.

Beak short, black, often with a reddish cross band; a dark spot on the cheeks and sides of neck; tail long, fourteen feathers, the middle ones in the male very long, small, and pointed, the short outer ones with white edges; the longest pair all black. Male, in the winter or handsomest dress (and in this dress I shot them in Lapland as late as June), white head, with a reddish tinge; a long crescent-shaped red spot at the back of the eye; breast, back, and the middle wing feathers, black-brown; the white shoulder feathers very long and pointed. Length 20 in.; beak 1 in.; tarsus 1 in. 2 l.; tail very pointed, the side feathers, 2 in., and the middle ones, 9 in. long.

The old female, in winter dress, differs from the male in wanting the two long pointed tail feathers, and the long shoulder feathers, and the young male differs from the

female in the winter dress by the white shoulders and black beak, with a transverse orange band.

The summer dress of the male is: a pale grey spot around the eye; belly, under rump, and under tail coverts, white; sides of the belly blue-grey; all the rest of the body black, with rusty brown feather edges on the back and shoulders.

The female, in summer dress, wants the long tail feathers; on the side of the neck a large grey spot; a brown spot at the root of the beak, and the back of the eye; the rest of the head, neck, and back, blackish; shoulders with rusty brown, and wing coverts with broad grey edges; crop brown-grey, which merges into the white colour of the rest of all the under parts.

Never seen in summer, except up in Lapland, where they breed in the fell meadows, by the sides of the small fell lakes. The old males leave the females at the breeding time, and we used to see them in small flocks on the river down near the village, while the old females were busy with their broods up on the fells.

Egg very like that of the pintail, but smaller.

Subgen. 4.—*Somateria.*

Beak swollen, and elevated at the base; nearly straight, extending up the forehead, where it is divided by an angular projection of feathers, narrow at the end; nail strong, and hooked; lamellæ coarse; nostrils small, medial; tail fourteen feathers; male variegated, black and white; female grey spotted.

277. Somateria Mollissima, Leach. Ejder. The Eider Duck. D. F.

Breed on the sea coast, never in fresh waters. Length 2 ft. 3 in.; tarsus 2 in.; beak, from the end of the forehead feather ridge, 2 in. 2 l.; first wing feather rather shorter than the second, which is longest.

In the adult male the dusky green bill is swollen at the base (but without any knob as in the king duck), the nail is white; irides brown; upper part of the head velvet black;

divided at the sides of the occiput by a green band; cheeks white; back of head, and sides of neck pale green; neck, back, scapulars, lesser wing coverts, tertials (which fall handsomely over the wings), shoulder, and sides of rump, pure white; greater wing coverts black; primaries brown; upper neck white in front, lower neck cream yellow; breast black; legs and feet yellow-green.

The female is of a yellowish brown colour all over, with darker markings, not unlike a dark grey hen; wings and tail black.

Male, in summer, shot in July; the whole bird coal black; a pale streak through the eye; throat grey; upper breast watered yellow, brown, and black; lower breast black and brown; back blackish; of the old tail feathers nothing remaining except worn stumps.

On many places off these coasts, as the Isle of Bornholm in the South Baltic, but more especially on the coast of Norway, within the Polar circle, the eider breeds in great numbers.

278. S. Spectabilis, Flem. Prakt Ejder. The King Duck. D. F.

Nearly as large as the last; the angular projections of feathers from the forehead extends much further down the beak than the two side projections (in the common eider it is much shorter, and the lateral feather projections extend as far as under the nostrils), and the forehead in the male has an upraised swelling as in the scoters; beak orange in the male, brown in the female; legs in the male red. The male: crown and back of the head grey, sides of the head green; neck, upper portion of the back, and wing coverts, white; rest of back and upper tail coverts, black; primaries, secondaries, and tertials black, the latter falling over the wings; breast buffy white; all the rest of the under parts black; an oval patch of white on the black flanks. The female: general plumage pale brown, with darker markings.

I never heard of the king duck visiting these coasts,

except in an accidental manner, nor do I believe that it breeds on any Scandinavian coast.

The egg is smaller than that of the last; glossy pure blue-green.

Gen. *Mergus*, L.

Bill moderate, slender, cylindrical, straight; upper mandible tapering towards the tip, which is armed with a strong hooked nail; both mandibles deeply serrated; nostrils pervious, medial; legs short, placed far behind; hind toe lobed; tarsi compressed; tail rounded; they moult only once in the year, and the summer and winter dress are the same.

279. MERGUS MERGANSER, L. Stor Skrake. The Goosander. D. F.

The distance from the nostrils to the tip of the beak scarcely longer than half of the outer toe; neck bushy, especially in the male; wing speculum white, undivided. Male: head green; back black; wings and shoulders white; primaries black; rump and tail grey; all the under parts sulphur yellow; beak dark red, with a black ridge; eye red-brown; legs red. Female: ash grey above, with a red-brown head and white chin; tail rounded, eighteen feathers. Length 28 in.; tail 5 in.; beak from forehead 2 in. 4 l.; tarsus 1 in. 7 l.; but the female is considerably smaller.

Breeds in many parts of Scandinavia, from North Scandinavia up far into Lapland. Lays early; sometimes in the hole of a tree, sometimes on the open ground. Eggs about seven; dirty yellow, pointed nearly alike at both ends, much like those of the merganser, but thicker, and hardly ever of so clear a yellow.

280. MERGUS SERRATOR, L. Små Skrake. The Red-breasted Merganser. D. F.

The bushy head feathers long and thin, forming a kind of crest on the back of the head; wing speculum white, divided by a white band; the distance from

the nostrils to the tip of the beak is much longer than half the outer toe; length 24 in; beak from forehead 2 in. 3 l.; tarsus 1 in. 5 l.; beak red, above more brown; legs outwardly red, inwardly yellow-red.

Male: head and upper neck glossy black-green; a broad white ring round the neck; upper breast red-brown, with black spots; all the rest of the under parts white; back and shoulders black; the hinder parts and the sides of the body watered with black and white.

Female; grey-brown above; sides of the head reddish brown; much smaller than the male.

Is commoner than the last, quite as widely spread, but much more numerous in Lapland during the season than anywhere. All the eggs which I have taken of this bird have been on the ground; like those of the goosander, but more oval, and not so large.

281. M. Albellus, L. Sal Skrake. The Smew. D. F.

Wing speculum white, with a black cross band over the middle, and another behind; legs and beak lead grey; length 17 in.; beak 1 in. 2 l., conical, thick at the root; tarsus 1 in. 2 l.; middle toe 2 in. 2 l.; head, breast, and all the under parts in male, pure white, a great black-green spot on each side of the head over the eye, and a similar oblong one on the back of the neck; back, two cross bands on each side of the breast, and shoulders black; tail ash-grey; sides watered with zig-zag white and black lines; head rather bushy.

The female is grey-brown above, below shiny white; breast and throat ash grey; crown of the head and back of neck red-brown; a large white spot on the wings. The young bird resembles the female, but the wing spot is grey, not white, and the hinder part of the back is black. Is never seen on the south-western or eastern coast of Scandinavia except in winter. Breeds sparingly in the far north, but the egg is, I think, more difficult to obtain than that of any other Scandinavian bird, except the great auk. I fancy they breed more easterly in Siberia. The egg in my

collection was taken out of a hole in a tree between Iockmock and Quickiock, in Lulea Lapland. The year before a golden eye had bred in the same hole. The egg is so like that of the widgeon in shape, size, and colouring, that it is difficult to tell one from another, but the widgeon never breeds in a tree. I believe, when placed under a microscope, there is some difference in the texture of the shell.

Any man who really wishes to make an authentic collection of ducks' eggs should always collect nests as well. I always do, and this is a very great help in identifying the eggs.

The following description of a few ducks' nests will prove what I say to be correct:—

1. The Golden Eye.—The very thin light down is pure white; centre white; rays long, white, with a slight grey tinge towards the tip.

2. Long-tailed Duck.—The thick down is blackish grey.

3. The Pintail.—The large thick down is pale grey brown, with a light centre.

4. The Widgeon.—The down is not thick, dark grey-brown, with a paler centre.

5. The Teal.—Down short, greyish, with white spots on the ground of the white centre.

6. The Scoter.—The fine thin down is very pale, with a reddish grey tinge.

7. The Velvet Scoter.—Down dark, with pale grey spots.

8. The Merganser.—Down short and thick, pale blue-grey.

Fam. 3.—Pelecanidæ.

Toes four, all joined together by a broad web, and directed to the front; beak longish, hard, straight, point more or less bent down; face bare; tail stiff.

They all live on the sea coast, and lay a small quantity of eggs (one to five), white, covered over with a chalky substance. The sexes are alike in plumage.

Gen. *Sula,* Briss.

Beak long, sharp-pointed, very thick at the root; upper mandible toothed behind the tip; nasal furrow long; nostrils basal, scarcely perceptible; both mandibles crenated on the edges, and the gape extends far back under the eye, as also is the case with the cormorants; throat and face bare; legs short; wings long and pointed; first wing feather short; tail pointed; twelve feathers.

282. SULA BASSANA, Briss. Hafsula. The Gannet. D.

Length 3 ft.; tail 7½ in.; beak from gape 6 in.; tarsus 2 in. 1 l.; middle toe 4 l.; primaries and their nearest coverts black; all the rest of the plumage white, with a deep yellow ochre tint upon the head and neck; beak blueish; cere blue; legs green-brown; toes with long green-yellow streaks; eye yellow.

The female is less than the male. Young, grey-brown, white and brown spotted. Is rare on these coasts, and does not, I believe, breed in Scandinavia.

Gen. *Phalacrocorax,* Briss.

Beak long, sharp, edges not serrated; the point of the upper mandible forms a large hook over the tip of the under one; eye, cheeks, side of gape, and chin, bare; nostrils basal; wings short; third feather longest; tail rounded, twelve to fourteen elastic stiff feathers.

283. PHALACROCORAX CARBO, Cuv. Hafstjäder. The Cormorant. D. F.

Length 2½ to 3 ft.; beak from gape 4 in. 5 l.; tarsus 2 in. 6 l.; tail 6 in., fourteen feathers; a white gorget under the throat; back and shoulders brown-grey, with a bronze tinge; all the under parts, middle of the back and rump glossy blue.

In the spring the front of the neck is grey, and there is a white patch on the thighs; beak brown-grey; feet black; iris green; the head is bushy, but no top crest. The summer dress differs but little from this, only the white thigh

patch is wanting. The young is more tinged with brown. Is met with on many of the western coasts, both in summer and winter, right up to the North Cape.

There are found in Scandinavia two forms of cormorants, the one above described and a smaller one, which Nilsson calls the *P. Carbo medius,* Mellanskarf. This latter is a little over 2 ft. long; beak from gape 3 in. 6 l.; tail 6 in.; tarsus 2 in. 4 l.; outer toe 4 in.; the rings on the outer toe are fifty, in the larger form they are sixty.

284. P. Cristatus, Steph. Kräk Skarf. The Shag. D. F.

Tail twelve feathers, rounded; beak thin; the upper mandible not so hooked as in the last, as broad as high at the root; length 26 in.; tail 5 in. 4 l.; beak from gape 3 in. 6 l.; tarsus 2 in. 2 l.

Adult in winter and spring: the whole body colour glossy bronzed green; a high crest on the head; eye green; legs, feet, and beak black. In the summer and autumn the crest on the top of the head is wanting. The young are brown above, white underneath. Like the last, is met with on the north-west coast throughout the year.

Gen. *Pelecanus,* L.

Beak straight, long and broad; upper mandible flattened, ending in a large hook; a naked skin under the base of the under mandible, which forms a pouch; face and throat naked; nostrils basal; wings pointed; the secondaries as long as the primaries; tail rounded; twenty feathers.

285. Pelecanus Onocrotalus, L. Hvit Pelikan. F.

Length 5 ft.; primaries black; all the rest of the feathers white, tinged with rosy red; face pale flesh-colour; pouch pale yellow.

One specimen was shot in Finland in 1839, and another in Dalecarlia in 1850. Figured by Dr. Bree as "the white pelican."

Fam. 4.—Pygopodes, Ill.

Back toe absent or free; beak not crenated; wings short, small; tail short or none; front toes webbed or fringed.

Group 1.—Feet with four toes. All breed in fresh water.

Gen. *Podiceps*, Lath.

Beak long, conical, straight, compressed at the sides; nostrils basal near the top edge of the beak; naked cere from the eye to the beak; legs large, set far back; tarsi flat; front toes only webbed at their roots, but after that fisso-palmated; hind toe lobed; no true tail; wings small; the first and second feathers alike and longest. Sexes alike, but there is a great difference between the summer and winter plumage. All lay three to six eggs on a flat, generally floating nest, dirty white, oblong, pointed alike at each end.

286. Podiceps cristatus, Lath. Hvit Strupig Dopping. The Great Crested Grebe. D. F.

Beak from gape longer than head; from the feathers on the forehead 1 in. 6 l., reddish; throat white at all seasons; length 20 in.; beak from gape 2¼ in.; tarsus 2⅝ in.

The twelve outer wing feathers brown, with white tips to the five or six inner ones; the next two are all white, but with brown bands to the shafts; the rest are all pure white.

Summer plumage: cheeks white; crown of the head occipital; crest, and a large ruff of feathers standing out round the neck, glossy black; on the sides of the head reddish yellow; front of the neck and all the under parts silvery white; hinder neck and all the upper parts dusky brown, save a white patch on the wing; sides of the body with a reddish tinge; beak reddish brown; eye red; legs dusky.

In the autumn the whole upper parts become browner,

with grey feather edges, and the sides of the body lose their red tinge.

In the winter the occipital crest totally disappears, and the grey back becomes brown, and this is much the plumage of the young birds in the spring. The beak is whitish in winter, with brown back; the throat and neck in front are pure silvery white at all seasons. A summer migrant to the north.

This species is common in all the south and midland districts, but it is not known exactly how far north it goes, certainly not so far as the next.

287. P. Rubricollis, Lath. Grä Strupig Dopping. The Red-necked Grebe. D. F.

Beak from the gape about 2 in.; black; yellow at the root; throat in the old bird ash grey at all seasons; the first fourteen wing feathers brown, the fifteenth brown, with a white spot; the rest white.

The female is smaller than the male, the head less glossy, the beak thinner, and the white eye streak not so plain. The male has no ruff as in the last, but on the back of the head there is a small bushy divided crest, not forming pointed horns; sides of the cheeks grey; breast red; under parts white; upper parts deep black-grey; a white spot on the wing.

In the winter the crest totally disappears; bill grey-brown, with yellow base; legs and toes outwardly brown, inwardly pale yellow; head above, and on the sides, as well as all the upper parts of the body, black-brown, with broad ash grey edges; front of the neck brown-grey in the middle (in the crested grebe it is pure white), with a red-brown scarcely perceptible spot on each side; under parts silvery white.

Young: sides of the head white, longitudinally streaked with brown; throat white; neck in front red-brown; breast and belly dirty white; otherwise like the adult in winter. Not rare in the south of the country, and I have received the nest and eggs from Lulea Lapland. Is said to be only

seen in Finland in spring, and on the south-west coast of Sweden only in winter.

As well as the last, breeds in Denmark. I never got this nest on the Wener, where the last breeds commonly.

288. P. Cornutus, Lath; P. Arcticus, Boie (female in autumn). Svärthufvad Dopping. The Sclavonian Grebe. The Eared Grebe. D. F.

Beak small, black, with pale tip, equally convex on both mandibles; length from the forehead 1 in., high 3⅓ l.; breadth 2⅔ l.; length 14 in.; tarsus 1 in. 7 l.; outer toe 2 in. 4 l.

A good deal of confusion has existed respecting the identity of this Sclavonian grebe. It is now, I believe, pretty clearly decided that we have but five good species of grebe in Europe, all of which are included in the Swedish fauna.

Summer dress: head black; front of the throat red-brown; a rusty band of long bushy feathers over, and at the back of the eyes; a bushy cravat of long black feathers underneath it; all the upper parts black; the under parts atlas white; sides tinged with red.

Autumn: head smooth, with no ears or cravat; and, like all the upper parts of the body, blackish brown; under parts white; throat and cheeks whitish; a streak at the back of the eye, and the front of the neck rusty brown.

The twelve first primaries in the adult bird are at all seasons grey-brown; the thirteenth with a brown spot on the end, the rest pure white; the inner ones at the tip and on the outer fan black-brown. In the young bird the twelve first primaries are altogether brown; the thirteenth with a grey-brown spot on the end, the rest white.

The young bird in winter has the head and upper parts black; throat and cheeks white; neck in front grey; under parts white; sides black and white. Is sparingly distributed over the whole country from Gothenburg up to East Finland, and far up into Norway.

289. P. Nigrocollis, Br. Svart Halsad Dopping. The Black-necked Grebe (Gould). D.

Beak thinner, but about as long as in the last, and convex on the under mandible, on which account it appears to be rather turned up; colour all black, as high at the root as it is broad; length about 12 in.; tarsus 1 in. 6 l.; outer toe 2 in. 4 l.

Summer: head and throat black, without any cravat; a yellow streak of long small pointed feathers at the back of the eye; upper parts of the body black; under parts white, with a rusty tint on the sides; breast and sides finely spotted with black. The first eleven wing feathers are always grey-brown, the following pure white, the inner ones on the tip, and in the outer fan black-brown.

Winter: head above dark brown, smooth; throat and cheeks white. May then best be distinguished from the last by the shape of the beak. The young have the head and back dark brown. Seems to be very rare in Scandinavia.

290. P. Minor, Lath. Små Dopping. The Dabchick. D.

Beak short, from the forehead 6 l., 3 l. high at the root, and 2 l. broad, black; gape of the mouth whitish; no bushy feathers at any season on the head, and no white feathers on the wing; length about 9 in.; tarsus 1 in. 2 l.

Summer: top of the head and back black; front and sides of the neck brown-red; lower breast silvery grey; sides of the body with black-grey spots, sometimes with a rusty tinge; under parts shiny white; eye reddish.

Winter: head and upper parts dark greyish black; sides of the head and front of the neck rusty grey. Is met with here and there in the south and middle of the country.

Gen. *Colymbus*, L.

Beak long, sharp, straight; nostrils small, basal; head large; no bare spots near the eyes; legs and feet large; toes webbed, not fringed, as in the grebes; wings small; first and second feathers longest; tail short, rounded; eighteen to twenty feathers.

The sexes are alike in plumage, but the male is the largest; lay two large oblong eggs by the side of the water,

green-brown, spotted with black, and very similar in the different species except in size.

291. Colymbus glacialis, L. Is Lom. The Northern Diver. D. F.

Beak straight, 3 in. long from forehead; convex, alike on both mandibles; suture of the beak quite straight; length of male about 2 ft. 9 in.; beak from gape 4 in. 3 l.; height over nostrils 1 in.; tarsus 3 in. 3 l.; outer toe 4 in. 6 l.; tail 2 in. 5 l.; carpus 15 in.

Summer: beak black, paler at the tip; legs, outwardly dark brown, inwardly whitish; head and neck black, with a green and purple tint; two patches of white and black bars, on the sides of the neck; back, shoulders, wings, and all the upper parts, glossy black, strewed with white spots, those on the shoulders large and square, on the wing coverts and hinder parts, small, fewer, and round; breast and belly pure white.

The female is smaller.

In winter and when young—in which plumage it is always obtained in Southern seas, and called the imber: head, back of neck, and all the upper parts, grey-brown, with broad ash-blue edges to the feathers on the back and shoulders; throat, cheeks, neck in front, and all the lower parts, white, but in the younger birds, spotted with grey in front of the neck; beak is also paler.

Is only an occasional winter visitant to these coasts, and I believe was never known to breed in Scandinavia.

292. C. Arcticus, L. Stor Lom. The Black-throated Diver. D. F.

Beak above rather more convex than below; the beak suture, rather curved; beak from forehead 2 in. $\frac{7}{8}$ l.; carpus 13$\frac{1}{4}$ in.; length of the male about 2 ft. 4 in.; beak from gape 4 in.; tarsus 3$\frac{3}{8}$ in.; tail 2$\frac{1}{2}$ in.

Summer: beak black; head and back of neck ash grey; throat and neck in front, violet black; above the top of the throat, in front, is a transverse row of small white spots;

on the side of the neck a similar band; back, shoulders, wings, and upper parts, pure black; on the shoulders a large oblong patch, with twelve to fourteen transverse rows of white square spots; some smaller white spots on the wing coverts; breast and under parts pure white.

The young and old in winter resemble the young of the last, and can scarcely be distinguished, except by the size and form of the beak.

Breeds commonly all over Scandinavia, from the north of Scania to far up into Lapland and Finland, but principally in the interior of the land. Sommerfeldt mentions that every winter the black-throated divers are seen off the north coast in Waranger Fjord. Are met with on the Bohus land coast all through the year.

293. C. Septentrionalis, L. Små Lom. The Red-throated Diver. D. F.

Beak 2 in. long from the forehead; upper mandibles rather concave; edges of the mandibles round, and bent inwards; carpus 12 in.; nostrils divided by a skin across the middle; length of the male about 2 ft.; tail 2 in. 1 l.; tarsus 2 in. 6 l.

Summer: sides of the head and throat ash grey; an oblong red-brown band in front of the neck; body colour above glossy brown; in the old birds without a spot, but in the younger birds with small white streaks and spots on the wing coverts and back; under parts pure white.

Female smallest.

Young and old in winter: head and back of neck ash grey, finely spotted with black; all the upper parts black-grey, strewed obliquely with small white spots and streaks parallel with the edges of the feathers; cheeks, throat, front of the neck, and all the under parts, white; neck in front with fine grey-brown spots; cheeks and sides of the neck yellowish; beak whitish, with a brown top.

The old bird, in the transition from summer to winter: back and shoulders uniform black-brown; head and neck

ash grey; a long red-brown spot on the front of the throat; here and there speckled with white.

The black-throated diver is difficult to distinguish in this dress from the red-throated, but in the former the head and back of the neck is blue-grey unspotted, the upper plumage has a more blue-grey tinge, and there is a broad brown band stretching down from the rump to the thighs, moreover the size of the birds, and the shape of the beaks, will serve as distinguishing marks.

The red-throated diver is much the most common in Lapland during the summer, but not nearly so as the black-throated in the midland districts.

Both these divers are said to cover up their eggs when they leave the nest, like the grebes. I do not deny that it may sometimes be so, but it is not always the case, for in *all* the nests that I have taken, I have found the eggs bare.

Alcidæ.

With only three toes; breed by the sea coast.

Gen. *Uria*, Briss.

Beak sharp and straight, as broad as high at the root; upper mandible convex, with a small hooked point; nostrils basal, covered by the feather ridge, which extends out on the beak; legs short; no hind toe; front toes webbed; tail short; wings short; first feather longest.

294. Uria Troile, Tem. Sill Grisla. The Guillemot. D. F.

Secondaries white at the points, which forms a white stripe across the black wing; length 1 ft. 5 in; carpus 7½ in.; beak from gape 2 in 5 l. long, at the middle 1½ l. broad, and 3½ l. high; tarsus 1 in. 4 l.; eye small, brown; beak and toes pale brown; tail twelve feathers; shafts of the outer primaries white.

Summer: head and neck black, tinged with soot brown; back and wings, as well as all the upper parts, except the white streak on the wing, black, tinged with grey; all the under parts pure white.

Winter: all the upper parts tinged with ash grey; under parts white.

The young differ from the old in winter dress by the flanks being streaked with white; the throat and front of the neck finely black and speckled white.

Var. A.—1. *Uria Lachrymans.* The ringed guillemot. A white ring round the eye, and one of the same colour at the back of the eye.

2. A white streak at the back of the eye, but no white ring.

B.—*Uria Intermedia.*

Beak high and long; from the nostrils to the tip as long as tarsus; beak as high as the length of the second joint of the middle toe; shafts of the primaries white-grey. Length about 1 in. 5 l.; beak from the gape 2 in. 5 l., in the middle 2 l. broad, 4½ l. high; tarsus 1 in. 4 l. Is met with in the Baltic.

C.—*Uria Brunnichii,* Sab.

Beak high, compressed from the gape, 2 in. 2 l. long, in the middle 2 l. broad, 4½ l. high, or equal to the middle toes' second joint; the shafts of the primaries brown; scarcely so large as the common guillemot.

The great difference between this and the common guillemot is in the shape of the beak.

Nilsson does not make a species of either the ringed guillemot or Brunnich's. Bree makes the ringed guillemot only a variety of the common, but seems to allow Brunnich's to be a good species. Kjärbölling makes all three good species.

The common guillemot in one form or other is met with on all these coasts, right up to the North Cape, but I do not think Brunnich's guillemot ever breeds in Scandinavia.

295. U. Grylle, L. *Tobis Grisla. The Black Guillemot. D. F.

The whole body colour black in the summer, with a large white spot on the wing; black beak; mouth and feet red, in the young yellow-red. In the winter the upper parts are grey-black; under parts white; but the shorter beak and the large white patch on the wings will distinguish this species at all seasons. Length 13 in.; tail 2 in. 1 l.; beak over nostrils 1 in. 3 l. long; 3½ l. high; 1 l. broad.

Is common in the South and goes up far within the Polar circle. Is more of a coast bird than the last.

Gen. *Mergulus*, Ray.

Beak very short, convex at top; at the root of an equal breadth and height; nostrils basal, only half covered; first wing feather longest.

296. MERGULUS ALLE, Ray. Alke kung. The Little Auk. D. F.

Black and white; some white streaks on the shoulders, and a white streak over the wing; winter, a small white spot over the eye, and a white ring round the neck; wings equal with the tail, which is 1 in. 2 l. long, with twelve feathers. Length 8½ in.; beak from gape 1 in.

Never breeds in Scandinavia; only accidentally seen off these coasts, principally in winter.

Gen. *Mormon*, Ill.

Beak shorter than the head, compressed at the sides, and very high; upper and under mandibles convex alike; both mandibles transversely furrowed; bare cere round the eye; wings small, first and second feathers longest; sexes alike.

297. MORMON FRATERCULA, Tem. Lunne fogel. The Puffin. D. F.

Black above; white underneath; a black ring round the neck; sides of the head white-grey; three furrows, at least, across the beak, in front of the nostrils, in the adult bird; tail sixteen feathers, even. Length 14 in.;

beak from the forehead 2 in., and at the root exactly as high as it is broad; grey-blue, with red tip. In the young bird the beak is only half as high as it is long, and smooth at the sides.

Is principally confined to the Scandinavian Polar seas, although occasionally a pair breed off the south-west coasts. They are rare, however, except in the far north.

Gen. *Alca*, L.

Beak feather clad on its inner half; the outer half high, compressed, and transversely furrowed; upper mandible hooked and convex; under mandible with an angular projection near the tip; nostrils medial, covered; first primary longest; secondaries very short.

298. ALCA TORDA, L. Tordmule. The Razor Bill. D. F.

Black above; below white; wings formed well for flight, and, when closed, reach over the tail root; tail sharp, twelve feathers. Length 1 ft. 7 in.; head and beak 4 in.; beak from gape 2¾ in. long, and about 1 in. high; eyes small, brown; beak and legs black. In the summer there is a small white streak in front of the eye, which is not observed in winter, and the front of the neck to the middle is black, but white in the winter; the white spot on the side of the neck, and the white transverse streaks across the beak, are apparent at all seasons.

Is met with in the Cattegat and the Baltic, but more commonly in the Polar seas.

299. A. IMPENNIS, L. Garfogel. The Great Auk. D. F.

As large as a tame goose in the body. Length 2 ft. 10 in.; tail 3 in.; beak to the forehead 3 in. 5 l. long, 1 in. 6 l. high, with round edges above and below, and eight white transverse furrows on the upper mandible, ten on the under; tarsus 2 in. 2 l. In the summer the throat and all the upper parts are black; a large oblong white spot between the eye and gape; secondaries

edged with white; under parts white. In winter the cheeks, throat, and front sides of the neck, white.

I do not believe this bird is extinct, although not one has been seen, nor an egg taken, for several years. Never bred on any Scandinavian coast. The value of this bird and egg is as well known in the North as in England. But about ten years ago a couple of eggs were sold in Denmark for 50 dollars, a little over £5.

It will be seen by the foregoing list that 299 species of birds are included in the Scandinavian fauna, and out of these about 230 are indigenous, or breed in the land; whereas, out of the 357 British species, scarcely 180 breed in Great Britain; out of 299 Scandinavian species, 277 are also met with in Britain. So that this list will be very useful to the British as well as the Scandinavian collector, as giving him concise descriptions of the greater part of the birds met with in Great Britain.

Dr. Bree, in his new list of the European birds, gives us 553 species. Of these—

4	are doubtful as to authority of occurrence or species.
67	of undoubted, though of more or less rare, occurrence.
482	may fairly be considered as belonging to the European avi fauna.
553	total.

BIRDS MET WITH IN SPITZBERGEN AND GREENLAND.

In order to render this work as complete as possible, and a useful guide to the collector and naturalist, I add a list of all the birds at the present day met with both in Spitzbergen and Greenland.

The list of the birds of Spitzbergen is by Malmgren, who visited that island in 1862 with the Swedish expedition.

The list of the birds of Greenland is by Dr. J. Reinhardt, of Copenhagen, 1860.

THE AVI FAUNA OF SPITZBERGEN.

Birds which are indigenous to, or yearly breed on Spitzbergen.

1. The Snow Bunting. Is the only song bird on Spitzbergen. Just as I always fancied in Lapland, Malmgren says that the snow bunting builds its nest generally under a large flat stone; and as I have seen old females of both this and the shore lark come out of such places, I am confident both breed in the same manner, doubtless to guard their nest from the Arctic fox.

2. The Ptarmigan. *L. Alpina*, var. *hyperborea*. He mentions seeing them in full winter dress on June 4th, and strong flying young on August 22nd. Fancies it is different from the Scandinavian ptarmigan, but cannot say how far it is identical with the Greenland bird (*L. Reinhardti*). I believe, however, most naturalists consider we have only one true type of ptarmigan, subject to some climatic changes.

3. The Ring Dotterel.

4. The Purple Sandpiper. Very common.

5. The Grey Phalarope. Not rare.

6. The Arctic Tern. Very common.

7. The Ivory Gull. Is common on the coasts, but always in the vicinity of the drift ice. Never sits on the water like the other gulls, but always on the edge of the drift. On the 7th June, 1861, he discovered, on the north coast of Murchison's Bay, 80° north, a quantity of ivory gulls which had taken up their residence on the side of a chalky cliff some hundred feet high, in company with kittiwakes and glaucous gulls. The last occupied the higher zone of the rock. The ivory gulls, on the contrary, occupied the ledges and clefts from fifty to one hundred feet high. He could distinctly see the old birds sitting on their nests, which, however, he could not reach. On the 30th July he went again, and, by the help of two men and ropes, managed to reach two nests, each of which contained one egg. The nest was carelessly

built in a hole in the earth, of dry moss, grass, etc., and here and there a feather. The eggs were "hard sat on," but strange to say, he does not describe them. Shot both females at nest, and they, as well as the eggs, are preserved in the Stockholm Museum.

8. The Kittiwake. Very common. Always breeds in company with the ivory and the glaucous gulls, the ivory gulls taking the lowest position on the rock, the kittiwakes the middle, and the glaucous gulls the uppermost.

9. The Glaucous Gull. Common along all the coasts.

10. Richardson's Skua. *Lestris parasitica,* Nilss. Tolerably common. They often follow the kittiwakes, but never the glaucous or the ivory gulls.

11. The Fulmar Petrel. Very common on the north coast of Spitzbergen.

12. The Brent Goose. Common on all the coasts. Does not appear to breed on the islands off the north coast, but on the fast land. Took a nest in Trenzenberg Bay, with four eggs, in the end of June. By the way, I fancy it was one of these very eggs which I saw in a collection at Gefle in 1862; and on my remarking what a dilapidated condition it was in, I was told that it was brought down from Spitzbergen with a lot more eggs, in a barrel, packed in salt! Rather a novel mode this of transporting valuable eggs.

13. The Bernicle. Not seen by Malmgren, but, according to Torell, is without doubt met with there. The principal breeding place of this goose appears to be North Russia, east of the White Sea.

14. The Bean Goose. Appears to be rare on Spitzbergen.

15. The Long-tailed Duck. Is sparingly distributed along the coasts, and breeds in small companies, always by the side of fresh water; and this I found invariably the case in Lapland.

16. The Eider Duck. Very common.

17. The King Eider. Certainly does not breed on these coasts north of 79° 5′, for these were well explored by the expedition, and not a bird seen. He does not deny that it

may be found on the south-west coast, but fancies that it is rare even there.

18. The Red-throated Diver. Breeds commonly up to 80° 45′ north lat. Singular that the black-throated diver is not known north of Scandinavia.

19. The Black Guillemot. Is common on all these coasts, but nevertheless not nearly so much so as Brunnich's guillemot. He notices respecting *Uria glacialis*, Brehm., which was also very common, that it is certainly no distinct species, but only the black guillemot in its summer dress after the first winter. After the second winter it attains its full plumage, and is then able to breed. The full-grown black guillemot from Spitzbergen has a rather smaller beak than the Scandinavian bird, but is not a distinct species.

20. Brunnich's Guillemot. Is the commonest of all the birds on Spitzbergen, and is the only form of common guillemot which is seen there.

21. The Little Auk. Very common on these coasts. Are excellent eating; fried "rot ges" (their Spitzbergen name, from their peculiar cry, "Rott-tet-tet-tet") and dried reindeer flesh are two of the delicacies of the island.

22. The Puffin. Is spread over the whole coast, but not common on the north coast.

Birds which only occasionally visit Spitzbergen, but do not breed there.

1. *Falco Gyrfalco*, Nilss. Seems to be very rarely seen there.

2. The Snowy Owl. One example was shot on the 10th July, 1861, between Verlegen Hook and Shoal Point, by a walrus hunter, at 80° 10′ north lat.; and this is the only time it has been shot on Spitzbergen, and at so high a latitude. There is little to tempt birds of prey on Spitzbergen in the winter, where there are no lemming, as on Melville Island, Nova Zembla, Taimyr Land, etc., and where the ptarmigan are by no means plentiful.

3. The Dotterel. Keilhan mentions, in 1827, that he found a dead dotterel here on the coast. This must have

been a solitary individual, which by some chance had flown there and died of hunger, for not a single specimen has ever been seen since, nor is it probable that a bird which lives on insects (*coleoptera*), and their larvæ, could find nourishment for itself and family in a land where only twelve to fifteen small and rare insects are met with, and not one of these are *coleoptera*.

4. That the Grey Lag Goose breeds on Spitzbergen, as stated by Torell, must be a mistake, because this species does not belong to the Arctic fauna. In Sweden and Finland it does not go over the Polar circle. (How is it, then, that, according to Sommerfeldt, the grey lag geese are seen on the coast of North-east Finland, in the spring, on their way to their breeding places on Tamsoe, in West Finmark?) A seal shooter told him that, two years before, he shot a swan in a trask near Stor Fjord. This was probably a Bewick's swan, which has a higher northern range than the common wild swan.

5. The Pomarine Skua. Captain Ross mentions that he saw a pomarine skua fly by the boat on this coast, in 82° north lat. But this species has never been seen here by any one since. It breeds in Prince Regent's Inlet and in Taimyr Land. More frequent in North Greenland and the north of Scandinavia, but rare on Iceland and the Faroes.

Birds which should be expunged from the fauna of Spitzbergen, in which they have been placed through mistaken observations.

1. *Fringilla Linaria*, Scoresby. Without doubt the bird which Scoresby took for this species must be some other one, because it is against all nature to suppose that *F. Linaria* should live on Spitzbergen, where it could not find nourishment for a single day. It was most probably nothing else than the young of the snow bunting.

2. Common Sandpiper. Must have been another mistake of Scoresby's.

3. Sabine's Gull. } Waygat Straits, where these birds
4. Ross's Gull. } are reported to have been seen, was

well explored by the Swedish Expedition in 1861, and if either had been there they must have been noticed. Sabine's gull was first discovered by Ed. Sabine breeding with the Arctic tern, on three low islands in the north end of Baffin's Bay, twenty English miles from the west coast of Greenland, in 75° 5′ north lat.

The two first examples of Ross's gull were found off the coast of Melville's Peninsula, 69½° north lat., but they have never been observed further north than this. Is altogether a stranger to Greenland, North Europe, and Asia.

5. The Great Black-backed Gull. Keilhan must have mistaken individuals of the glaucous for this gull, which is not a high Arctic bird.

6. The Great Northern Diver. Not a single naturalist, except Phipps, who journeyed towards the North Pole in 1773, has ever seen any other diver there except the red-throated.

7. The Razor Bill. Another mistake of Parry's.

Prof. Sundevall's list of the birds which he saw on Spitzbergen in 1838, agrees with the foregoing.

The ornithologist will see that Spitzbergen presents but a meagre bill of fare, and the oologist will scarcely find there half a dozen birds breeding whose eggs he would care to take.

The white fox and the reindeer appear to be the only animals that live on this barren island. The Polar bear occasionally floats on his drift ice-rafts to these wild shores, and the principal animal life appears to be in the seas which surround it, which swarm with walrus and seals of every species.

Ninety-three species of phanerogamous plants are met with on Spitzbergen, of which eighty-one are known in Greenland, and sixty-nine in the north of Scandinavia.

LIST OF THE BIRDS OF GREENLAND, FROM REINHARDT.

Greenland comprises two colonies, of which South Greenland is divided into six settlements—Julianashaab, Frederikshaab, Fiskerrnær, Godthaab, Sukkertoppen, and Holsteinsburg. North Greenland into seven settlements—Godhavn, Egedesminde, Christianshaab, Jacobshavn, Ritenbek, Omenak, and Uppernivik.

Birds which regularly breed in Greenland.

1. The White-tailed Eagle.

2. The Greenland Falcon. He notices two forms—*F. Islandicus*, Hanck, and *F. Greenlandicus*, Hanck—one as common as the other everywhere.

3. The Peregrine. Some naturalists have supposed that the Greenland peregrine differs from the European bird, and have given the Greenland form the name of *F. Anatum*. He thinks, however, that there is no difference.

4. The Snowy Owl. Very common. In the summer more numerous in the north, than in the south.

5. The Wheatear.

6. The Rock Pipit.

7. The Raven. Holböll considers the Greenland raven to form a particular race—*Corvus Corax Littoralis*. Reinhardt says he cannot see any difference between the Greenland and common European bird.

8. The Mealy Redpole. Common and migratory.

9. Holböll's Redpole. Constantly resident.

10. The White-crowned Bunting. *Emberiza leucophrys*, Wilson. An American species. Not numerous, but certainly a breeding species.

11. The Snow Bunting. } Common.
12. Lapland Bunting. }

13. The Ptarmigan. *L. Reinhardti*, Brehm. Very questionable whether the Greenland form really differs from the common European ptarmigan.

14. The Ring Dotterel.

15. The Turnstone.

16. The Knot.
17. The Purple Sandpiper.
18. Schinz's Sandpiper.
19. The Sanderling. Scarce, but breeds on Disco Island.
20. The Red Phalarope.
21. The Grey Phalarope.
22. The White-fronted Goose.
23. The Brent Goose.
24. The Bernicle. A doubtful breeder.
25. The Wild Swan. Formerly bred in many places near Godthaab, but was long ago exterminated by persecution during the breeding season. It is now apparently reappearing.
26. The Common Wild Duck.
27. Barrow's Iceland Duck.
28. The Harlequin Duck.
29. The Long-tailed Duck.
30. The Eider.
31. The King Eider.
32. The Merganser.
33. The Northern Diver.
34. The Red-throated Diver.
35. The Razor Bill.
36. The Puffin.
37. Brunnich's Guillemot.
38. The Common Guillemot. The *Uria hringvia* is, he adds, only a variety of the common guillemot, and very rare in Greenland.
39. The Black Guillemot.
40. The Little Auk.
41. The Greater Shearwater.
42. Leach's Petrel.
43. The Fulmar Petrel.
44. The Pomarine Skua.
45. Richardson's Skua.
46. Buffon's Skua.
47. The Great Black-backed Gull.
48. The Glaucous Gull.
49. The Iceland Gull.

50. The Kittiwake.

51. The Ivory Gull.

52. Sabine's Gull. Very rare in the Danish settlements. Breeds only to the north of Uppernivik.

53. The Arctic Tern.

54. The Cormorant.

Birds which are only accidental visitors to Greenland, or domesticated.

1. The Short-eared Owl. Scarce.

2. The American Swallow. *H. Rufa,* Bp. Only two specimens have ever been obtained. Distinguished from the English Swallow by the chestnut belly and vent.

3. The Marsh Wren, American. *T. Palustris,* Nilss. One only specimen has been obtained, and that was in 1823, at Godthaab.

4. The Ruby-crowned Wren, Am. *Regulus calendula,* L.

5. The Yellow-rumped Warbler, Am. *Motacilla coronata,* L.

6. The Black-throated Green Warbler, Am. *M. Virens,* Gm.

7. The Black Pole Warbler, Am. *Silvicola striata,* Swain.

8. The Hemlock Warbler, Am. *S. parus,* Wils.

9. The Blue Yellow-backed Warbler, Am. *S. Americana,* Swain.

10. The Nashville Warbler, Am. *S. Rubricapilla,* Wils.

11. The Mourning Warbler, Am. *S. Philadelphia,* Wils.

12. The White Wagtail. Has been obtained twice in Greenland.

13. The Meadow Pipit. One single specimen has been obtained in the country.

14. The Red-wing. Two specimens have been shot here.

15. The Hermit Thrush, Am. *Turdus minor,* Gm. One specimen.

16. The Small Green-crested Fly-catcher, Am. *Tyrannula pusilla,* L.

17. *Tyrannus cooperi,* Nutt. (Am.) Accidental.

18. The Red-eyed Fly-catcher. *Viriosylva olivacea*, B. P. (Am.)

19. The Starling. Only one specimen, a female, has ever been sent from Greenland.

20. The Red-winged Starling. *Agelaius phœniceus*, Veill. One female has been obtained.

21. The White-winged Crossbill. Very accidental.

22. The Shore Lark. One single specimen, probably an American bird, was shot at Godthaab in 1835.

23. The Yellow-bellied Woodpecker; Am. *Picus varius*, L.

24. The Gold-winged Woodpecker, Am. *P. Auratus*, Nilss.

25. The Domestic Cock.

26. The Grey Plover. Occurs in very limited numbers.

27. The Peewit. Two specimens have been accidentally obtained.

28. The American Golden Plover. *Charadrius virginicus*, Bork. It is a most exact observation of the late Prince Bonaparte, that the golden plover found in Greenland is the American species, and not the European golden plover, for which it has been mistaken by nearly all former writers. I have now before me two specimens, sent by Holböll himself to the Royal Museum, under the name of *Charadrius pluralis*, and both prove to be the Virginian plover, with grey axillaries.

29. The Oyster-catcher. Has seen three skins from Greenland.

30. The Common Heron. A specimen was found dead in 1856 near Nerotalik.

31. The Whimbrel. Occasional.

32. *Numenius Hudsonicus*, Lath. Four specimens appear to have been obtained in Greenland.

33. The Esquimaux Curlew. Two specimens have been shot here.

34. The Common Godwit. Very rare.

35. The Dunlin. Probably breeds here.

36. The Yellow-shanked Sandpiper, Am. One single specimen is on record.

37. *Tringa pectoralis*, Bp. Three examples are on record. Am.

38. The Red-breasted Snipe, Am. Only one specimen is recorded.

39. The Common Snipe. Has been so often observed in Greenland that it probably breeds there.

40. The Land Rail. One example.

41. The Spotted Crake. Two examples.

42. The American Rail. One example in 1822.

43. The American Coot. Legs grey; beak red, tipped with white. Two specimens on record.

44. The Common Domestic Goose.

45. *Anser hyperboreus*, Pall. Only young birds have been obtained.

46. The Pintail. Accidental, but not very rare.

47. The Green-winged Teal, Am. Four specimens have been sent to Copenhagen within the last twelve years.

48. The Teal. Rare.

49. The Widgeon. As rare as the last.

50. The Scaup. Very rare. He adds that he considered two males and one female, which were sent from Nerotalik in 1859, to be the first ever obtained here, until he learnt from the "Ibis" that Dr. Walker had already procured it during his short stay ar Godhavn.

51. The Crested Duck. On the authority of Mr. Walker, was obtained at Godhavn in 1857, during the stay of the "Fox" at that place. The capture of this duck in North Greenland must be considered as very extraordinary, for it does not inhabit North America, and Iceland even is not included in its northern European range.

52. The Buffel-headed Duck. One only example on record.

53. The Surf Scoter. Only a very few specimens obtained.

54. The Sclavonian Grebe, Gm. Only a few birds, and these young, obtained in the south of Greenland.

55. *Podiceps holbœllii*, Rhdt. Three specimens are on record of this new species.

56. The Great Auk. Nearly extinct; but even formerly only seemed to visit Greenland in the winter, and in limited numbers, chiefly young birds.

57. *Fratercula glacialis*, Leach.

58. *Fratercula cirrata*, Pall. Only one specimen on record.

59. Manx's Shearwater.

60. The Common Skua.

61. *Larus chaleopterus*, Licht. Probably nothing more than a variety of the Iceland gull.

62. The Herring Gull. Quite accidental, and an extremely rare bird in Greenland.

63. *Larus affinis*, Rhdt. New species; unique. Appears to be closely allied to the herring gull.

64. *Rhodostethia rosea*, Macgill.

65. The Gannet. Accidental and rare.

66. *Pagophila brachytarsa*, Holb. A new gull discovered by Holböll, of which, unfortunately, no collection seems to possess an authentic or type specimen.

As might be expected from its geographical position, the North American types preponderate in the avi fauna of Greenland. When, from the 118 species hitherto observed there, we deduct 63 which occur throughout the whole Polar zone, and accordingly must be considered not to bear on this question (at least, as far as they are constantly resident in Greenland), of the remaining 53, there are 35 North American species, 19 European, and a single one (the ptarmigan) possibly peculiar to Greenland. A still more marked North American feature of the fauna results from an observation of Holböll's, that Greenland receives only four of its regular birds of passage from Europe (the peregrine, the wheatear, the whimbrel, and the wild swan); and should even this number prove to be too small, and some others—for instance, the common snipe and the white-fronted goose—be added, there will still be a great preponderance of such birds migrating to Greenland from North America. But, on the other hand, Greenland is marked as

being the most westerly, though regular, boundary of some strictly European species, not only of the birds of passage already mentioned, but also of others, such as *Aquilla albicella*.

I may add that any naturalist wishing to visit Greenland will perhaps find his easiest route by Copenhagen, from which place sailing vessels (large and well appointed ships), carrying the mails, start for Greenland as soon as the sea is open, calling at all the coast settlements, and continuing to run to and from Greenland throughout the summer. I am not sure whether a steamer does not now run from that place, but I fancy so. All information, however, can be procured of the British Consul in Copenhagen. I question much whether a *mere trip* would *pay* the collector; but doubtless, if a man were to spend one winter and two summers in the country, he would do much. To my fancy, Lapland, and North-east Finmark, and Russia possess greater attractions to the British ornithologist at the present time than any other European countries.

CLASS III.—REPTILIA.

ORDER 1.—CHELONIA. (Tortoises.)

Dorsum large, depressed; heart-shaped; covered with strong horny plates; feet depressed like fins.

EMYS. Fresh Water Tortoises.

Gen. *Emys*. Fresh Water Tortoises.

Dorsum low, flat; five plates on the back; twenty-five along the sides; shield on the breast oval, consisting of five plates; five toes on each foot, of which all the front ones, and four behind, are furnished with pointed claws; cheeks horny; tail short, scaled.

1. EMYS LUTARIA, Bon. Kärr Skolpädda.

Length, 6 to 7 in.; breadth, 5 in.; colour blackish brown.

Is met with no longer in Scandinavia at the present day, and although fossil remains are occasionally dug up in the turf mosses of the South, has no more right to be included in the present fauna, than the now extinct *Ursus Spelœus* or *Bos Urus*.

ORDER 2.—SAURIA. (Lizards.)

Consists of many groups or sub-orders; of these the Scandinavian fauna owns only one.

Sub-order *Sauri Squamati*.

Body covered with scales; head above, with plates; mouth small, furnished with teeth; ears either apparent

or covered. This sub-order can be divided into two families, *Sauri Proprii* and *Ophiosauri*.

Fam. 1.—Sauri Proprii.

Body not so slender as in the *Ophiosauri*; furnished with four feet, each of which has five toes, armed with claws. Ears apparent.

Gen. *Lacerta*, L.

Head covered with plates; upper part of the body with scales; underneath with transverse four-cornered plates, in six or eight broad rows; two rows of teeth on the palate; eyelids present; tongue warty.

2. Lacerta Agilis, L. Sand Odla. The Sand Lizard.

This is the largest of all the Scandinavian lizards; attains a length of 10 in., of which the head will be about 6 l.; neck 5 l.; body 2 in. 3 l.; tail 5 in.; colour grey-brown, with a brown band along the back; covered with blackish and white figures and spots; palate with two rows of teeth.

I cannot agree with Professor Bell when he says that Linnæus clearly meant the present species to be the type of *Lacerta Agilis* in Sweden. Certainly Linné, in his "Fauna Suecica," notices two species, the one the *Lacerta vulgaris* or *vivipara*, Ray., and under the *L. Agilis* he gives us three forms, and it is certain that his variety γ which he calls "*Lacerta dorso punctis albis duplici serie*," belongs to the *Lacerta vivipara*, because he distinctly says, "*Habitat ad templum* Iockmock, Luleusis, Lapland." Now it is quite clear that the true sand lizard was never met with so far north, not even so far up as Upsala (as Linnæus says). It is, in fact, in my opinion, rare even in the south, for when I was collecting in Scania, I rarely obtained a specimen, whereas on the opposite coast of Denmark, around Helsingor, it was extremely common on all the low sandy grassy banks, and I could obtain any number of specimens in a day. It is distributed over the middle and south of Sweden generally, I believe, but is nowhere very common,

whereas I have never been in any part of Sweden, from Scania up to Quickiock, Lapland, where I did not meet with the little viviparous lizard, and Nilsson corroborates this statement.

This species may always be distinguished from the next by the thicker form, the shorter and thicker tail, the teeth on the palate, and the much more handsome appearance. I never saw the common lizard here spotted with white in the same manner as the sand lizard.

3. L. VIVIPARA, Jacq. Skogs Ödla. The Viviparous Lizard.

Usual length about 6 in. (head and body 2 to 4 in.); colour varies much; usually brown with a dark line down the back; the under parts whitish; no teeth on the palate.

Common all over Sweden, from the very south up to at least Quickiock, Lapland.

Fam. 2.—OPHIOSAURI.

With the general characters of the true lizards, the members of this family unite the following: the body is elongated, snake-like; above and below covered with smooth scales; not carinated as in the lizards, and with either very short or no feet.

Our European blind or slow worm, is, in fact, a familiar representative of the great family of skinks. No external traces of limbs can be found, but under the skin, rudiments of legs may be discovered.

Gen. *Anguis*, L.

Body cylindrical; covered with small smooth scales.

4. ANGUIS FRAGILIS, L. Armslå. The Blind Worm.

Brown-grey above; steel blue below; usually a small black streak along each side of the back, and sometimes a similar one along the middle of the back; scales roundish, flat; tail blunt, and easily broken, as in the lizard.

Like the viviparous lizard, it brings forth living young. The largest specimen I ever saw in Sweden was 14 in., of which the tail was $7\frac{1}{4}$ in. I think, with Professor Bell, that the length of the tail in many reptiles is dependent upon the sex. I have observed that in the female it is generally longer than in the male.

The slow worm is found pretty generally dispersed over most parts of the Scandinavian continent. Nilsson says that he has received a specimen from Lulea Lapland. It must, however, be extremely rare so far north. I could never hear of one; in fact the only reptiles I met with there, with the exception of the common frog, were the viviparous lizard, and one specimen of the common viper.

ORDER 3.—OPHIDIA. (Snakes).

Body long, rounded, without even the rudiments of feet; covered with scales and plates; no eye-lids; unlike the last two orders, the *ophidia* have the power of greatly stretching the swallow and throat by means of the peculiar formation of the under maxillary bones.

1. Serpentes Innocui. Harmless Snakes.

Two rows of solid teeth, of an equal size, along each side in the jaw both above and below, and no poison fangs. The head is covered with broad plates.

Gen. *Coluber*, L.

Head covered with broad plates; eye with a round pupil; tail on the under side covered with divided shields and occupies at least one-sixth of the whole body.

5. Coluber Natrix, L. Snök. The Ringed Snake.

Above black or olive grey, bestrewed with black spots; below blueish black; a white or yellow band on the top of the side of the neck; scales of the back, lancet shaped, with a small raised keel along the

middle of each; three small plates behind the eye; usual length 4 ft.

The common Swedish snake differs so much in appearance from Professor Bell's fine engraving of the British ring snake that both myself and other Swedish naturalists have almost doubted whether they are identical. Our snake is generally lighter in colour, and the spots in one row along the sides.

Is common in all parts of Sweden and Norway, but it is hardly correctly ascertained how far north they go. I fancy scarcely up to Lapland.

Abdominal plates 170. Sub-caudal plates, 60 to 65 pairs.

6. C. Lævis, Schleg. Slätt Snök. The Smooth Snake.

It has always been a matter of surprise to me that this species, which is not uncommon in Sweden, and very common in many parts of the continent, should have so long been overlooked in England, for it is only just lately that it has been added to the British fauna.

It may at once be distinguished from the common snake by the total absence of the yellow "cravat," by its duller colour, and by the smooth sleek appearance of the whole body; for the scales, instead of being carinated as in the common snake, are perfectly smooth and polished, without the least sign of a keel. General colour: brown, with rows of blackish spots along the back, a band over the neck, and a streak at the back of the eye of the same colour; reddish brown on the sides; under parts cinnamon red and yellow mixed, with or without spots, or steel grey speckled with yellow along the sides; iris red-yellow; mouth and tongue red; abdominal plates and scuta much as in the common snake, both in shape and numbers; usual length about 2 ft.

Is nowhere so common in Sweden as the last, but still not so rare as has been supposed. Has been taken fre-

quently in the south of Sweden, and in the middle as far up as Upsala; not rare near Christiania in Norway.

The habits of this snake are different from those of the common snake, and they are never found in moist situations, always on high, dry, stony tracts, covered with bushes and heath. Specimens have been taken even on the top of the Dovre Fell. They can climb well. One kept in confinement here for five months eat nothing but a single snail, and would not look at a frog; it drank a great deal of water. They are easily tamed, and Nilsson mentions some interesting facts in the economy of the before-mentioned snake. It soon became tame, and never after was heard to hiss; on the ground it could not go along so easily as the common snake, but was very fond of creeping up book-cases, furniture, and the like. It was more lively than the common snake, but not so pliant, although much more so than the slow worm. Its manners in confinement lead one to guess that it was much used to live in trees; and Bechsten even mentions having found the castings of a skin of one of these snakes hanging in a small fir tree.

It is now clearly proved, according to Schlegel's account, that this snake brings forth living young, thus showing a sort of affinity to the slow worm. About the end of August is the usual breeding season here.

2. Serpentes Venenosi. Venomous Snakes.

One row of small solid teeth in the palatine bone on each side, but no teeth in the upper maxillary bones, except the two isolated poison fangs; head covered with small plates and scales; tail not more than one-eighth or one-ninth of the whole length of the body.

Gen. *Vipera*, Daud.

Head covered with plates (of which one large one is in the middle, with several smaller ones symmetrically arranged around it) or even with scales alone; eye with a vertically oblong pupil; tail short.

7. VIPERA BERUS, L. Vanlig Huggorm. The Common Viper. The Adder.

Nilsson gives us the following synonymes: *Coluber Berus*, L., "Faun Suec.;" *Vipera Berus*, Daud., Bell, "British Reptiles," p. 58.

To this belongs *la petite vipère* (*C. Chersea*), Cuv.; Regne. An. (his *C. berus* belongs to the *C. aspis*, L., which is not Swedish).

Pelia Chersea, Bp. Asping Svensk.

Black variety, *C. prester*, L.; black viper, Bell; Svart huggorm (Svensk.), Smaland "bosse."

That the common viper is subject to great variation in colour I will not deny, for I have frequently myself killed in Sweden, all the varieties mentioned by Bell—the brown, red, and black; and as far as my examination would lead me to believe, they were all the common viper in different states of colouring, but that Linné's *C. prester*, is nothing more than a black variety of the common viper I do not believe; in fact, I think we have in Sweden two very distinct species of the black viper, and although Linnæus seemed to be aware of the fact, no other Swedish naturalist except Magister Hardin of Carlstad appears to be so.

During a little excursion with that gentleman in 1861, over the North Wermland fells, we killed a black viper basking in a small wood by the side of "Hagg Fell," Ostmark, which we preserved in spirits, and brought home. When we examined it afterwards, it exactly tallied with Linné's description of the *C. prester:* abdominal plates 153; tail scuta 32. In describing this *coluber prester* in his "Fauna Suecica," Linné says: "Vipera anglica *Nigricans*, Smolandis bosse; habitat in sylvis rarior. Corpus *atrum*." In his description of *C. berus*, in the same work he says: "Vipera anglica fusca, Sw., Huggorm. Corpus cinereum dorso linea undulata nigricante conspicua; habitat in Suecica frequens." Abdominal plates 146; scuta 39.

Now it is evident that in his time as well as at the present day, this *C. prester* was rarer than the *C. berus*. The Swedish name was different, and he well described the differences of colour, for in this *C. prester* which we killed, the black colour was much deeper and duller than in any black viper I had ever before seen (and while living at Trolhattan, south of this, I often used to kill the black viper, but always on wet mosses, never, as in this case, on high ground), and the black line on the back, which Linné gives as a characteristic of the *C. berus*, was not perceptible in this specimen.

Now, without placing too much reliance on the number of the squamous plates as a mark of distinction—for, like the fin rays of a fish, they may be liable to variation—I fancy an accurate and careful examination of the plates of the backs of the heads of these two vipers, might be of some value in determining a distinct species, they are so very differently shaped and placed. In *C. prester* the three large plates are much broader than in *C. berus*, and they are placed side by side in a straight direction. There are no other plates behind them—the scales do not appear so sharp as in *C. berus*, but broader and rounder, coming close up to them—whereas, in *C. berus*, the three large middle plates are placed in a slanting direction (at least only the middle one is straight), and there are two more (smaller ones) behind them, in all making five.

Perhaps, after all, the size and position of these head-plates may be subject to variation, but there is so marked a difference in the appearance of the back of the head of this viper which we killed, and the head of a common black viper, with which we compared it, that if I could only prove, by an examination of some more specimens that this was constant, I should not hesitate to decide that Linné's *C. prester*, was a good and distinct species, and one which, since his time, has been totally overlooked.

The viper may always be known by the flat head covered with small plates and scales, by the short tail, which occupies only one-ninth the length of the body, and a much less

number of abdominal and sub-caudal plates, always thirty of the former and twenty of the latter less than in the ringed snake. It is difficult to determine the exact number of these, but, according to Lenz, the male viper has 139 by 36 to 145 by 41, and the female from 130 by 28 to 150 by 33. The colour varies much, according to age and sex, but the back is always darker than the rest of the body, usually dirty yellow or olive brown, with spots along each side; belly steel blue, sometimes with a yellowish tinge. It seems curious, but I have observed that the black variety is very local, and where one is found, others are always in the neighbourhood; usual length two feet, rarely more. Is met with in all parts of Scandinavia, as far up as South Lapland, and, according to Nilsson, its most northerly range is between 66° and 67° north lat. I killed a female specimen up at Quickiock, Lulea Lapland, and I killed a magnificent specimen in May, 1864, in South Wermland. They usually pair here in May, and the female brings forth her living young in August. Nilsson says that they can pair in the third or fourth year, but they are not full grown till the sixth or seventh.

Respecting the incredible story of the old viper swallowing her young when disturbed, I can only say that such a thing was never witnessed either by myself or any other man with whom I have spoken, nor did any one here ever hear of such a thing till I mentioned it.

AMPHIBIA.

Body naked, covered only with a clammy skin. When young they breathe through gills. Can live on land as well as in water.

ORDER 4.—BATRACHII.

Body naked, with four feet, which have no claws. Like the snakes, they change their skins, but piece by piece, in the water. When young, they breathe through gills, after-

wards by lungs. During the breeding season they all live in the water, but at other times principally on land.

Nilsson remarks :—"It is singular that each of the three foregoing orders find types in the batrachia—thus the tortoises are represented by the toads, the lizards by the newts, and the snakes by the cæciliæ.

Tailless Amphibia.

Body broad and short; no signs of a tail when full grown; four toes on the anterior extremities; five on the hinder; skin smooth or tuberculated.

Fam. 1.—Ranida. Frogs.

Teeth in the upper jaw and on the vomer; hinder legs much longer than the fore legs, on which account they hop readily.

Land Frogs.

Gen. *Hyla*, Laur.

Readily distinguished by a disk or cushion at the extremity of the toes, which enables them to adhere to the leaves of trees and other smooth substances. The males have a vocal bladder on each side of the neck; hinder toes half webbed; body smooth above.

8. Hyla viridis, Laur. Löf Groda.

Colour green above, white under, with a yellow and black streak through the eyes and along the sides of the body.

This is the smallest and handsomest of all the frogs, measuring rarely over an inch and a half. Is rare in Sweden, and confined to the shrubby plantations of South and East Scania.

Water Frogs.

Gen. *Rana*, Li.

Hind toes wholly webbed; toes round, with no disk nor cushion.

9. RANA TEMPORANIA. Vanlig Groda. The Common Frog.

Subject to much the same variations in colour as the British frogs; usual length here 8 in. 2 l., of which the body to the anus is 3 in. 2 l.; front legs 1 in. 7 l.; hind legs 5 in. 4 l.

Is certainly the commonest of all the Scandinavian reptiles, and goes furthest north, for they are met with in all parts, from the very south to far up in Tornea Lapmark. Is common even up at Hammerfest and Tromsoe, and on the Norwegian fells; goes higher than the limits of tree vegetation.

Three species of frog are included in the Scandinavian fauna, and one of them, *Rana arvalis*, Nilss., is in all probability nothing more than a local variety of the common frog. Clermont does not notice it in his "Quadrupeds and Reptiles of Europe."

10. R. ARVALIS, Nilss. Åker Groda.

Colour above marbled with black, and three longitudinal pale bands; more pointed than in the common frog; a black spot through the tract of the ear, and a black streak through the nostrils; size about that of the common frog.

The principal differences, according to Nilsson, lie in the osteology of the two species. In *R. Arvalis*, if a cross line is drawn across the head from the front edge of the eyes, the distance from that to the point of the nose, will be the same or even longer than that between the edges of the eyelids in front, and one and a half times as long as the distance between the nostrils.

In the *R. Temporania*, this is quite different. In the latter the long toe on the hind foot has two joints protruding from the web; in the *R. Arvalis* always two and a half or three.

Has been taken in many places in Sweden as far up as Upsala. In the summer is principally found in grass fields and among potatoes.

11. R. ESCULENTA (Schinz nec Lin.) Ätlig Groda.

Colour greenish, with black spots, and a long yellow streak down the back; only one joint of the long hind toe protrudes beyond the web; length of the head and body 3 in., of the fore legs 1½ in.; hind legs 4½ in.

I question whether this species was known to Linné as Swedish. It is certain that the *R. Esculenta*, described in his "Fauna Suecica" as found in Smaland, is nothing more than *R. Temporania*. It is very rare in Sweden, and confined only to two or three places in the south. Appears to have been identified some thirty-five years ago by Professor Retzius.

Gen. *Bombinator*, Merr.

Tympanum of the ear hidden; tongue grown to the mouth throughout the whole of its under side; body covered with warts; hind toes joined together with a whole web to their very ends. Appear to form a link between the frogs and the toads, and live principally in water.

12. BOMBINATOR IGNEUS, Merr. Klöck Groda.

Grey-brown above, or dirty olive green; below reddish yellow, with blue spots. Is the least of all the frogs here, rarely exceeding 1½ in. in length; hind legs about 2 in.

This curious little frog appears to have been introduced into Denmark about the same time as the carp, by one Peder Oxe, and to this day, in some places in Scania, they go by the name of Peder Oxe's frog. Their note in the pairing season strongly resembles the ringing of bells. As this sound proceeds from the depth of the water, it appears to come from a long distance, although the frog may be within a few fathoms. Linné, in his "Journey through Skåne," remarks that the "korn grodoma" croaked in the afternoon as if we heard large bells ringing at a distance of half a mile (Swedish), although they were close to us in the pools. They seemed to be unusually vociferous, and I could well fancy that I listened to many church-bells all ringing together on a Sunday. I wonder that no one acclimatizes them, in

order to hear nature's harmony in a concert of frogs." In the autumn they are often seen on land, and their motions are as lively as those of the common frog.

Gen. *Pelobates*, Wagl.

Tympanum hidden; tongue only grown fast on the front half; body covered with warts above, below smooth; hind toes wholly webbed; under the root of the innermost toe a large compressed grisly knob.

13. PELOBATES FUSCUS, Wagl. Lök Groda.

Irregularly spotted with brown and grey; a streak of the latter colour down the back; usual length 2 in. 4 l.; hind leg 3 in.; fore leg 1 in. 4 l.

Might easily be confounded with *Bufo variabilis*, for both are of the same colour, but in *P. fuscus* the pale grey colour forms irregular longitudinal bands in the green-brown colour, and one of these bands stretches over the anus and hinder part of the back. The front part of the back is covered with irregular large spots, the hinder part with small. Female always larger than the male.

Is confined to the south of Sweden, but probably more widely spread there than has hitherto been supposed.

This frog differs from all the others in emitting a strong smell of white onions, especially when irritated, whence its Swedish name of lök, or onion frog.

The following anecdote, by Professor Wahlgren, might be read with advantage by those marvel-mongers who are so fond of retailing anecdotes of live toads being found imbedded in stone, etc.:—"As a proof how easily those who are but little acquainted with zoology may regard as a miracle that which proceeds from very natural causes, I will just name that, in digging for the gas works in Helsingborg, in July, last year, at a depth of sixteen to eighteen feet, first a common toad was found, and the next day two *bufo calamita* and one *pelobates fuscus*, all living. All fancied that these animals had lain there buried time out of mind. The lucky finder described the circumstance in the newspapers as something like a miracle, with the addition that

the animals had neither mouths or eyes. The last found example came into my possession; it was well fed and lively, and had its stomach filled with fragments of *harpulus ruficornis*, etc. It was clear that these animals, during their nightly wanderings, had fallen into the deep pit, and at daybreak had buried themselves in the loose sand at the bottom, where they were found by the workmen. It appears to me very probable that many such wonderful histories could be explained, if they were only investigated by any one versed in natural history."

I quite agree with the Professor, and without altogether denying that the frog or the toad are able to exist for a length of time in situations which would be speedy graves to the higher organized animals, I must say, that if any one who rushes into print with anecdotes of this or the like kind, would only give himself the trouble to investigate a few of the facts connected with the main incident which he regards as so marvellous, and state them as well, the study of natural history would be shorn of half its mysteries.

Fam. 2.—BUFONIDÆ. Toads.

No teeth in either of the jaws; hind legs a very little longer than the fore ones, so that they creep instead of hopping.

Gen. *Bufo*, Laur.

Body above strewed with warty excrescences; tympanum visible; the web on the hinder toes indented at the edges; tongue free on the hinder portion; no teeth.

14. BUFO VULGARIS, Laur. Vanlig Padda. The Common Toad.

Body thickly covered with warts; colour dark or greyish brown, with irregular black spots; hinder toes half webbed. Is the largest of all the Swedish *batrachiæ*, frequently 3¼ in. long and 2¼ in. broad.

The common toad differs at a glance from the *Bufo calamita*, on account of its more than half webbed feet; from *B. variabilis*, on account of its more visible tympanum, and

from both on account of its oblong rather crooked ear swelling.

Is found in many places both in Sweden and Norway, but it is not clearly ascertained how far north it goes. I never saw one in Lapland, although frogs were plentiful.

15. B. VARIABILIS, Merr. Grönfläckig Padda.

Body covered with warts; ear-knob large, flat, oblong; tympanum very apparent; hinder toes half webbed; fifth much shorter than the bottom joint of the first; in the common toad it is of an equal length; colour above green, with white streaks; below white, with irregular spots on the breast; length about 3 in.

Is met with in the south of Sweden; in many places as common as the last.

Bibron has decided that this is nothing more than a variety in colour of the natter jack (*B. Calamita*), and I think so myself.

16. B. CALAMITA, Laur. Stink Padda. The Natter Jack.

Body olive green above, covered with warts; a smooth yellow streak along the middle of the back to the anal opening; length to anus $2\frac{6}{8}$ in., to the point of the longest toe 5 in.

Nilsson remarks that there is a great resemblance between this and the last, but in the natter jack the hand inwardly is rough with warts thickly placed together; points of the toes hard and brown; first like fourth, third a little longer, second longest. In *B. variabilis* the warts on the hand are neither so close together nor so high; the tips of the toes of the same colour as the toes; third like the fourth, and shortish, second longest.

These certainly, if constant, would seem to constitute specific differences, but I think they are too slight to be relied upon. Is met with in many tracts in the south of Sweden.

URODELA.—AMPHIBIA WITH TAILS.

Body elongated, nearly round; resemble the lizards in shape, but their skin is naked, without either scales or plates; they have teeth in both jaws, and two rows on the vomer.

Fam. 3.—TRITON, Laur. Newts.

Tail (at least on the outer extremity) compressed at the sides; no porous swelling behind; the eyes as in the last. The male has, during the breeding season, a fin-like crest on the back and tail, and a flap of skin on the upper lip; front toes four, back toes five.

17. TRITON CRISTATUS, Laur. Storre Vatten Ödla. The Common Warty Newt.

Skin granulated; colour above greenish black, covered with more or less distinct black spots; breast and belly bright orange yellow, with large round black spots; sides strewed with white spots; the lateral comb in the male broken over the loins, and deeply serrated. The female during the breeding season has a very slight dorsal ridge; length 5 in. 4 l., of which the tail is 2 in. 1 l.

Is not uncommon certainly in the middle and south of Sweden. I cannot say how far north it goes, but I never met with a newt of any kind in Lapland.

18. T. ALPESTRIS, Laur. Brunn Ödla.

Skin granulated; colour above slate; below reddish yellow, with a row of black spots along each side of the belly; usual length 4½ in.

Has as yet only been met with in one place in Scandinavia. Not far from Landekrona, in the south.

I have heard it doubted whether this is anything more than a variety of the last. Bonaparte, Bibron, Dumerel, and Schinz consider it a good and distinct species, but I believe Swedish naturalists are now decided that it is not so.

19. T. PUNCTATUS, Cuv. Mindre Vatten Ödla. Common Smooth Newt.

Skin smooth; above pale brown or dark; below whitish or yellowish red, bestrewed with round black spots; and on the sides of the head streaked. The comb in the male unbroken, and the hind toe edged with a web. Length 3 in. 4 l., of which the tail is 1 in. 5 l.

Is quite as common in the middle and south of Sweden as the common warty newt.

Nilsson remarks that Professor Bell, in his handsome work on the British reptiles, has described two distinct species of newts with smooth skins, which he characterizes by the upper lip being straight in the one, and with a skin hanging over the under lip in the other. In the former the hind toes are round, in the latter edged with a short web. I may here remark that in our *T. Punctatus* the upper lip is furnished with such a skin lap in the breeding season, when the back is ornamented with a high serrated comb, and the hind toe edged with a skin. All these skin laps disappear from the back, the upper lip, and the hind toe, after the breeding season is over. I have specimens in which the lip skin is present on one side and wanting on the other. It is certain, therefore, that if Bell's two species are distinct, some other specific distinction must be found. The same remark may perhaps hold good respecting *T. Cristatus* and *T. Brebonii*.

There is so little difference between the reptiles of Scandinavia, Denmark, and Finland, that one list may almost suffice for the three countries. The principal difference lies in the number of individuals of the different species found in either country.

CLASS IV.—PISCES.

[NOTE.—In the following list of the fish found in the waters of Scandinavia, Denmark, and Finland, the arrangement, ray formulæ, and colour, is strictly after Nilsson.]

I.—OSTEROPTERYGII.

Skeleton bony.

ACANTHOPTERYGII.

All the fin rays single, without joints. The first portion of the dorsal fin, or the whole, when two are present, with spinous rays; and also the anals and the ventrals, with one or more of the anterior rays spiny. The rays on the first dorsal whole, single, generally sharp.

Fam. 1.—PERCIDÆ.

Cheeks soft; margins of the opercle and preopercle (generally both) serrated, or armed with spines; jaws and vomer with teeth. The anterior rays of the anal fin spiny, and generally one spine in each ventral.

1. Ventrals under the Pectorals. *a.* Two dorsals.

Gen. *Perca*, L.

Body oblong; back arched; scales large and hard; opercle armed with a single spine; preopercle dentate; opercle without scales; tongue without teeth.

1. PERCA FLUVIATILIS, L. Abborre. The Perch. D. F.

Common in all the Scandinavian waters, at least as far up as 69° north lat. Varies much in colour, dependent on the water; but the five dusky transverse bands

on the sides, and the black spot on the dorsal, always present. Attains a large size here, a perch of 5 lb. not being uncommon; spawns in May; frequents brackish as well as fresh waters.

Fin Ray Formula.

D. 15—1,14; P. 14; V. 1,5; A. 2,8; C. 17.*

The fin ray formula in all fish is subject to much variation, and can never be closely relied upon as a mark of distinction.

Gen. *Labrax*, Cuv.

Opercle scaled, with two spines; teeth on the tongue; sea-fish.

2. P. LABRAX, Cuv. Hafs Abborre. The Basse. D.

Sides silvery, without transverse bands; no spot on the dorsal; body longer, and back not so high, as in the perch. The largest example recorded to have been taken in these seas was 13½ in. long, and weighed 1¼ lb. Their usual size in more southern seas is 18 in., but they often reach 2 ft. and over. D. 9—1,12; P. 16; B. 1,5; A. 3,11; C. 17.

Is a very rare fish in these seas, and has hitherto only been accidentally taken off the southern coast of Norway, and once in the Sound.

Gen. *Lucioperca*, Cuv.

Body elongated, more resembling the pike than the perch; opercle without spines; preopercle serrated; teeth on the vomer; sides silvery white, with dark spots or transverse bands. Fresh waters.

3. LUCIOPERCA SANDRA, Cuv. Gös. D. F.

Colour greenish brown; sides silvery; sides of the back marked with ten to twelve transverse bands. Common in many of the Swedish fresh waters, which are

* The formulæ for the fins of fish are explained thus:—D. means dorsal fin; P., pectoral; V., ventral; A., anal; C., caudal; Br., the small fin, or fins sometimes attached to the bones of the operculum, or gill cover. The numbers express the rays, spinous or soft, thus—15, means 15 hard rays; 15,4, means 15 hard and 4 soft rays; V. 3,5, means ventral, 3 hard and 5 soft rays.

deep and clear up to 66° north lat., but is not known in Norway. A ravenous fish; takes a bait freely, but must be fished for deep; attains a large size; 11 to 12 lb. not uncommon; said occasionally to reach 20 lb. The flesh is white, firm, and excellent eating; but should be cooked directly the fish is taken from the water. Spawns in May; the roe is very small, and, as well as the young fish, extremely difficult to transport. D. 15—2,22; P. 15; V. 1,5; A. 2,12; C. 17.

b. One single dorsal fin.

Gen. *Acerina*, Cuv.

Small fresh-water fish, resembling a young perch; head naked, deeply pitted with small holes; colour olivaceous, spotted all over with minute black dots on the body and fins.

4. ACERINA VULGARIS, Cuv. Gers. The Ruffe. D. F.

Is common in most Scandinavian waters, up to within the Polar circle; but rare in the south. I have seen specimens 7 to 8 in. Spawns in May. D. 15,12; P. 13; V. 1,5; A. 2,5; C. 17.

Gen. *Polyprion*, Cuv.

Sea-fish, resembling gigantic overgrown perches; head rough and spinous; a spiny ridge traverses the opercle; eleven spiny rays in the dorsal; preopercle with teeth and spines on the margin.

5. POLYPRION CERNIUM, Cuv. and Val. The Stone Bass.

Form of body like the tench; scales covering the body and head, small, hardy, and rough.

The largest of the family in southern seas; said to attain a length of six feet, and a weight of 100 lb. Has only once been taken on any Scandinavian coast, off Bergen, in Norway, in July, 1843. This specimen was 19 in. long; colour when just taken, blue-grey above, silvery white underneath; tail edged with white; sides and belly silvery white; fins blackish blue; iris silvery. Br. 7; D. 11,12; P. 17; V. 1,5; A. 3,9; C. 17.

Gen. *Beryx*, Cuv.

Body high and short, nearly rhomboidical; head occupying one-fourth of the length, armed with spines; eyes extremely large; dorsal short, nearly hidden; scales large, hard, serrated; gape very wide.

6. Beryx borealis, Dum. and Kor.

The only known example of this fish was taken off Bergen in May, 1839, and is preserved in the museum there.

Nilsson gives us the specific characters:—"Head in front armed with six spines, of which two are on the side of the neck, two on the top of the nose, and two on its sides; colour deep red on the back, sides, and belly, shifting to a bright silvery hue, with a reddish tinge." Fins bright red. This specimen was 12 in. long, 4 in. high. Br. 8.; D. 4,18; P. 16; V. 1,10; A. 4,27; C. 5 + 20 + 4.

Nothing appears to be known of the habits of this rare fish.

2. Ventrals before the Pectorals.

Gen. *Trachinus*, L.

Body long and straight, the height one-sixth of the length; two dorsals, first short and high, with spiny rays, the hinder as well as the anal very long; two short spines in front of the eyes; scales small and smooth, running down the sides in oblique lines; sea fish; head not mailed.

7. Trachinus draco, Cuv. Vanlig (the Common), Fjärsing. The Great Weaver. D.

Colour very handsome in the living fish; eye silver white; sides of the head azure blue, with crooked yellow bands; a black spot on the first dorsal, the second white and green; sides brown-grey, with blue, white, and yellow streaks; anal fin rose-red; tail grey-brown, with grey spots. Br. 6; D. 6—30; P. 15; V. 1,5; A. 1,30.

Tolerably common on all the western Scandinavian coasts, and also in the south of Norway, but it is not known how far north they go. Specimens of from 12 to 15 in. are not uncommon.

The spines of this fish are certainly poisonous, and a wound from one is attended with unpleasant effects. As olive oil is applied to a snake bite, so the fishermen on these coasts look upon the oil from the liver of the northern chimæra as an infallible remedy against the sting of the weaver.

Couch's figure of the greater weaver does not represent the fish half so handsome as I have seen it on these coasts.

The little weaver (*T. Vipera*, Cuv.), which may always be known by its smaller size, and the shorter hinder dorsal and anal fins, with only about twenty-four rays in each, has not as yet been identified in these seas.

3. Ventrals beneath the Pectorals.

Gen. *Mullus*, L.

Body thick; head large, with a sloping forehead; two long appendages under chin; mouth small; opercle and preopercle, smooth on the margin; head mailed.

8. MULLUS SURMULETUS, L. Gulstrimmig Mullus. The Surmullet. D.

Is only occasionally taken off the southern coast; never higher than Christiania, and rarely exceeds 8 in. in length; body colour red, with three longitudinal yellow stripes along the sides; forehead sloping, not vertical. D. 8—1,8; A. 1,7; P. 17; V. 1,5; C. 15.

Fam. 2.—SCORPŒNOIDEI.

Head armed with plates of mail; no barbules under the chin; otherwise, this family much resembles the last.

Gen. *Trigla*, L.

Body long, covered with very small scales; head large; forehead sloping; two dorsals, the first very high and pointed. But the best distinguishing mark of this genus are the three long finger-like detached rays in front of the long pectorals.

9. TRIGLA GURNARDUS, Bl. Vanlig Gnöding. The Grey Gurnard. D.

Is the commonest of all the gurnards on these coasts, more especially in the Cattegat Sound and South Baltic and on the west coast of Norway. Goes far up within the Polar circle; yet, strange to say, not a single species of gurnard is met with on the coasts of Finland.

This gurnard may be known from any other by the grey colour of the back, covered with small yellow spots; sides below the sharp lateral line pink and yellow; the fin rays in the pectorals shorter than the head, and do not reach back to the anus; usual length 12 to 14 in. D. 8—19; P. 3,10; V. 1,5; A. 19; C. 13.

10. T. Blochii, Yarr. Gnöding Med Ryggen Flåck. Bloch's Gurnard. D.

Whatever obscurity may rest on the identity of Bloch's fish, the Swedish species, as described by Nilsson, agrees with Yarrell's description of Bloch's Gurnard, and one of his distinguishing marks is the dark spot between the third and sixth rays of the first dorsal. This spot must not, however, be relied upon as a safe or constant mark of distinction, and is not even noticed by Couch in his description of Bloch's gurnard.

Nilsson does not appear quite satisfied that this is a good species, but fancies that it may be the young of the last. It may, however, be always distinguished from the adult grey gurnard, which it closely resembles, by the first three spines in the foremost dorsal being quite smooth, and from the British red gurnard, which it resembles in colour, by the serrated lateral line.

Nilsson does not tell us the comparative length of the first ray in the foremost dorsal; he only says, in describing his specimen, which was 8 in. long, that the length of the head to the point of the opercular spine was as $3\frac{1}{4}$ in the whole length of the fish, and the greatest height occupied about $\frac{1}{4}$ in the length to the tail root. The longest ray in the first dorsal is rather more than $\frac{1}{4}$ of the body height. This description hardly seems to agree with Couch's figure of the British Bloch's gurnard.

Is not so very rare on the south-western coast of Sweden, but seldom exceeds 8 in. in length.

11. T. Hirundo, Bl. Stor Fenad (large-finned) Gnöding. The Sappherine Gurnard. D.

May always be known by the soft lateral line, and the immense broad pectorals, reaching back beyond the vent, which on some of these coasts have obtained for it the name of the "flyg fisk," or flying fish. Is sometimes taken here as long as two feet. Colour varies, dull brown to red, streaked with yellow; pectorals edged with blue. I may here remark that I fancy many of the different fish in these waters are not so highly coloured as their representatives in more southern seas. D. 8—16; P. 3,11; V. 1,5; A. 16; C. 12.

Cannot be called common in any of the Scandinavian seas, but most so in the Cattegat and Sound. Spawns in the end of July.

Gen. *Cottus*, L.

Small, dull coloured fish, living on the bottom; head soft, not mailed, more or less armed; body naked; two dorsals.

12. Cottus Gobio, L. Stensimpa. The River Bullhead. F.

Opercle smooth; preopercle armed with a single spine. Common throughout Scandinavia, as well in brackish as fresh water. Appears to go far north, for it is met with both in the bays of Finland and Lulea Lapland; but, strange to say, does not appear to be known either in the south of Sweden or Denmark. Are said to live in monogamy, and spawn in the spring. Usual length 4 to 5 in.; colour varies, brown-green, mottled with dark brown. D. 7—18; A. 14; V. 1,4; P. 14; C. 11.

13. C. Pœcilopus, Heck. Stensimpa Med Flackiga Buk Fenor (with spotted pectorals).

This species in size, colour, number of fin rays, and

appearance, much resembles the last, from which, however, it differs in having two spines on the preopercle, and a transverse band of dark spots on the ventrals.

Is occasionally taken in brackish water off the Stockholm coast, and Widigren includes it in his list of fish met with in Laggat Trask (fresh water), near Quickiock, Lulea Lapland, but it has never been identified in the south of Norway or Sweden.

14. C. Scorpius, L. Röt Simpa. The Father Lasher. D. F.

The largest of all the bull-heads. Met with only in salt water; frequently attains the length of one foot; two erect spines before the eyes; preopercle with three spines, the longest of which does not reach the point of the longest spine in the opercle; colour green; lateral line soft. D. 10—14; P. 15; V. 1,4; A. 11.

Is common on all the Scandinavian coasts, and found not only in the Bothnia, but even in the Polar Ocean, from Waranger Fjord to the White Sea. Spawns here in the end of autumn; and, from the circumstance of one's seeing scarcely one male to ten females, in the shoals that come on to the coasts at this time, Ekstrom fancies that the roe is fructified before the female deposits it.

15. C. Bubalis, Euph. Dverg Simpa. The Four-spined Father Lasher. D. F.

Much resembles the last, with which it till lately has been confounded. According to Nilsson, however, it is much smaller, as he says he has never here seen a specimen exceeding 6½ in. in length. The colour is more brilliant than in the father lasher. It has, moreover, three great spines before the eyes and four on the preopercle, the longest of which reaches as far back as the longest spine in the opercle. There is also some difference in the fin ray formula. D. 7—12; P. 14; V. 1,3; A. 9.

Is met with in all the Scandinavian seas, from the Sound to far up on the coast of Norway, but is not included in

Widigren's list of fish in Lulea Lapland. Said to spawn late in November or December, but the season is probably regulated by the age of the fish.

16. C. Tricuspis, Reinh. Tagg Grenig Simpa. F.

Resembles the father lasher much in shape and colour, but is smaller; the head shorter; the body more elongated; preopercle with four spines, the longest of which has two points. The lateral line is soft, and there is a difference in the fin ray formula. No teeth on the vomer. Length 8 in. to 9 in. D. 11—16; P. 18; V. 1,3; A. 18.

Specimens of a *cottus* exactly agreeing with the *C. tricuspis*, Reinh., have been taken by Liljeborg near the North Cape, and the Finnish specimens are mentioned by Malmgren as coming from the shores of the White Sea.

17. C. Quadricornis, Cuv. Horn Simpa. The Four-horned Cottus. F.

In appearance more resembles the last than any other of the family, for it is more slender and elongated than the father lasher; but it may easily be distinguished from either by the four large tubercles on the top of the head and the rough warts on the sides of the body. D. 8—14; P. 17; V. 1,3; A. 14; C. 11.

Is principally confined to the middle and north of the Baltic, and as far as Lulea Lapland, where they go far up into rivers. Attains a length of 8 in. Is also met with in Lake Ladoga, Finland. There is a smaller variety, rarely more than 6 in., met with in the Lake Wetter, in Sweden, in which the tubercles are smaller and more blunt, the warts on the body fewer, and the eyes larger. Spawns in December and January.

In all this genus the male may be known from the female by its more slender shape and longer fins. The anus lies in the foremost half of the body; the ventrals, when laid back, reach to the anus, and the dorsal fin beyond the root of the tail. In the female the abdomen is more protuberant, the

anus lies in the hinder division of the body, and the fins are shorter.

Gen. *Aspidophorus.*

Head mailed, depressed; spines on the nose; body covered with polygonal scaly plates; two dorsals, close together.

18. ASPIDOPHORUS CATAPHRACTUS, Nilss. Vanlig Botten Mus. The Armed Bull-head. D. F.

Is met with, according to Nilsson, on all the Scandinavian shores, from the Cattegat up to Waranger Fjord, near the North Cape; but is not included in Widigren's list of the fishes of Lulea Lapland. Length about 7 in. Spawns in the end of April. Colour brown-grey, spotted on the sides; belly white; fins speckled. Length 5 in. to 7 in. D. 5—7; P. 15; V. 1,2; A. 7.

Gen. *Sebastes,* Cuv.

All large sea-fish; shaped like the perch; head and body compressed; a few small spines; no tubercles on the back of the head, which is scaly; eye very large; opercle and preopercle spinous. One long dorsal; the front division spinous; the latter shorter and higher than the other, with weak rays.

19. SEBASTES NORVEGICUS, Cuv. Norsk Kung Fisk. The Bergylt. D. F.

Is taken occasionally on the coasts of Norrland, in Waranger Fjord, three feet in length. Its principal home appears to be within the Polar circle, and it rarely comes south, although small specimens are occasionally taken both in the Cattegat and Sound. Nilsson remarks that it is not improbable that the larger form of bergylt, which is taken off Lofoden, 3 ft. long, and there called "stor vern," may probably prove to be a distinct species. It is supposed here that an actual copulation takes place between the two sexes, and that the mother brings forth living young in June, which

follow her for a long time. This larger form is always found in deep water, 150 fathoms or so, whereas the smaller one is principally taken off the coasts of Heligoland, and on hooks baited with the *gadus esmarkii* (små seg) and herring, in the summer, at a depth of sixty to eighty fathoms. The flesh of the bergylt is said to be delicious. Colour vermilion-red; eyes bright yellow; forehead between the eyes flat; its breadth equal to $\frac{5}{6}$ in one eye diameter; pectorals oval, thin; lower eight rays single, all joined by a web nearly to the tips. Usual length of the southern specimens 18 in. to 2 ft. It is singular that very small specimens of this fish (under 8 in.) are even seen off these coasts. D. 15,14; P. 19; V. 19; A. 3,8; C. 16.

There is a smaller form in these seas, which Kroyer and Ekstrom both think is a distinct species, but which Nilsson considers only as a younger form of the common bergylt.

Gen. *Sebastes viviparus*, Kroy.

Pale reddish yellow, with a black spot on the tip of the opercle, and a few indistinct dark spots on the sides of the back. The points of the pectorals can reach back to the anus. Length 8 in. to 10 in.

The fin ray formula in both is much the same.

20. S. Dactylopterus, De la Roche. Blå Munt (blue-mouthed) Kungs Fisk.

Has never yet been met with out of the Mediterranean (where it appears to be common), except on the west coast of Norway, where it goes as far up as Heligoland. It is always in deep water, and its Norwegian name of "skjär ver" proves that here, as well as in the Mediterranean, it is principally found on rocky bottoms. This species differs from the last in the narrower forehead, in the rays of the pectorals being only half-covered with a web, a different fin ray formula, and by the hinder part of the mouth being deep blue. Forehead between the eyes deeply furrowed, its breadth

being equal only to one-third of an eye diameter. Colour bright red; much paler on the belly than the sides, with three indistinct dark bands. The largest specimen seen by Nilsson was taken off Bergen, and was 14 in. long. D. 12,13; P. 19; V. 1,5; A. 3,5; C. 13.

Gen. *Gasterosteus*, L.

Small dull-looking fish, living as well in salt as fresh water; head and body much compressed; head with spines or tubercles; body covered more or less with shield-like plates; several free sharp spines on the back, instead of a first dorsal; ventrals reduced to a single spine.

21. GASTEROSTEUS ACULEATUS, L. Tretaggad Spigg. The Three-spined Stickle-back. D. F.

Assuming, as I believe is now the general opinion, that the rough-tailed stickle-back (*G. trachurus*, Cuv.), the half-armed stickle-back (*G. gymnurus*, Cuv.), and the short-spined stickle-back (*G. brachycentrus*, Cuv.), are nothing more than three varieties of the common three-spined stickle-back (*G. aculeatus*, L.), we may observe that one or other form is met with in most of the Scandinavian waters, both brackish and fresh, from the very south of Sweden up to far within the Polar circle. They appear to assume their red marital colouring in May, are in high colour in the end of June, and even in the beginning of August. The usual length here 2¼ in. Three free rays on the back. D. 12; P. 10; A 1,8.

22. G. PUNGITIUS, L. Tio Taggad Spigg. The Ten-spined Stickle-back. D. F.

Is as generally dispersed in these waters as the last, with which it associates, but is no where so common. Usual length 1¼ to 2 in.

Noticing Mr. Newman's remarks on the Scandinavian species (quoted by Couch), and which, as Newman properly observes, is figured by Ekstrom in his magnificent work on the Scandinavian fishes, "with only nine spines on the back, and with a red colour on the gills and breast," I may add,

that this is clearly identical with the British fish, and that the number of ten dorsal spines, from which the fish derives its name, is by no means constant, for I have myself taken out of the same shoals examples with eight, nine, and ten spines, and Ekstrom himself remarks in the beginning of his description, "Through eight to ten free spines on the back, this species differs from the foregoing;" and in describing the summer dress, he says: "The whole of the upper part of the body very olive green, under parts paler green, with a yellow tinge, which under the head and at the roots of the pectorals becomes more ruddy." Widigren observes: "Is often found with but seven spines."

Ekstrom's figure was from a fish taken at Haparanda in June. It was a large specimen, in full summer tints.

Gen. *Spinachia*, Cuv.

Ventrals with two soft rays; lateral line armed with large carinated scales; body five-cornered to the anus; head not unlike the pike.

23. SPINACHIA VULGARIS, Cuv. Tång Spigg. The Fifteen-spined Stickle-back. D. F.

Fifteen free spines on the back; the largest of the genus 6 in. long; confined to the sea; frequent most of the Scandinavian coasts, the Cattegat, Baltic, and North Sea; very rare in Finland, and not mentioned in Widigren's list of fishes met with in Lulea-Lapland.

FAM. 3.—SCIÆNIDÆ.

Bones of the head and face deeply pitted; two dorsals; preopercle serrated; opercle with spines; no teeth on the vomer or palatines.

Gen. *Sciæna*, Cuv.

A row of strong pointed teeth in each jaw; anal fin, with only one small spine; no barbule under the chin, as in the *umbrina* which the *sciæna* much resembles; large sea fishes; two dorsals, the first spurious; scales large; more like the chub in the shape of the body than the perch.

24. Sciæna Aquila, Cuv. Hafs Gös. The Maigre.

The colour of the Scandinavian species, as described by Nilsson, "silver grey-white underneath; back brownish; fins red-brown," is so much plainer than in the Mediterranean fish, that, as Couch observes, it seems to afford a proof that a change of water or season will materially modify the appearance, as we know to be the case, indeed, with many other fishes.

Only one specimen of this fish has as yet been added to the Scandinavian fauna, and this was washed ashore in Landskrona, in the south of Sweden, December 24, 1852. It was five feet long, weighing seventy-two pounds.

Fam. 4.—Sparidæ.

In form resembling the fresh-water breams, but with spiny rays in the long single dorsal fin. Cheeks soft; edges of all the gill covers without teeth or spines; no teeth on the palate; body oval, compressed, covered with large scales; no scales on the vertical fins; anal very short, with three spiny rays.

Gen. *Pagellus*, Cuv.

All the front teeth fine and card like; molars small, in two or more rows.

25. Pagellus Centrodontus, Cuv. Pagell Med Fläck. The Common Sea Bream. D.

Has much the form of the fresh water rudd; body height about one-third of the length; colour reddish, with a large black spot on the commencement of the lateral line, which, however, is not apparent in the younger fish, or "chads" of about 6 in. long (Couch); attains a length here of 18 in. Br. 6; D. 12,13; A. 3,12; P. 17; V. 1,5; C. 18.

Appears to be the most common of all the species here, as every where else. Is occasionally taken off the southern coasts both of Sweden and Norway, principally in the summer.

Gen. *Cantharus*, Cuv.

Except that the body is thicker, and the teeth are different, this genus much resembles the last. The teeth, however, are all crowded together; the head is larger, and the form of the body not so neat.

26. CANTHARUS GRISEUS, Cuv. Grå Hafs Ruda. The Black Sea Bream.

Colour subject to variation, but never red like the last; the back is generally green; body with a reddish yellow tinge, marked with irregular brown lines. D. 11,12; P. 16; V. 1,5; A. 3,10; C. 17.

Is occasionally taken off the south-west coasts of Sweden and Norway; never, however, exceeding 16 in.

Fam. 5.—SQUAMIPENNES.

Form of body and character as in the last, but the dorsal and anal fins are closely covered with scales.

Gen. *Brama*, Bl.

The single dorsal and anals very long, covered with scales, and with but few spinous rays; card-like teeth on the jaws and palatines; the number of vertical rows of scales on the body about thirty-four.

27. BRAMA RAYII, Bl. Silfver Grå Hafs Braxen. The Toothed Gilt Head. Ray's Sea Bream. D.

The peculiar shape of this fish will at once distinguish it from the other sea breams. Body compressed very deep; the greatest height almost equal to half of the body length to the root of the tail; its thickness a quarter of its height, tapering off very slender to the root of the long curved tail; and, unlike any other sea bream, the dorsal and anal fins commence with a high point, formed by the elevation of the first rays; head small, very much sloping in front; nose short; eye large; colour, back brown-grey; sides silver grey; belly white; iris black, with a yellow ring round the pupil. Br. 7; D. 4,32; P. 20; V. 1,5; A. 2,28; C. 20.

Nilsson notices five specimens, which have been taken off the coast of Sweden up to 1850, and also says that others have been taken off Chistiania and Bergen in Norway. The length of his described specimen was 24 in., and it weighed 6 lb.

Gen. *Pterycombus*. Fries.

Dorsal and anal fins bare of scales; scales of body much larger; the number of vertical scale rows being only eighteen.

28. Pterycombus Brama, Fries.

Very much resembles the last, but besides the above-mentioned generic differences, the shape of the forehead is widely different, and the dorsals and anal fins set in a deep furrow, with a high ridge of large scales on each side. The colour could not be noticed, as the skin was dry and mutilated. Br. 7; D. 46; P. 20; V. 1,5; A. 40; C. 20.

The only known specimen of this fish is preserved in the Stockholm museum. It was brought down from Hammerfest, in Norway, by a sea captain in 1832. It was caught close to that town, where such a fish had never been seen before. Its length 19 in; 8 in. high; length of the head 4 in.

Mr. Couch, to whom I sent my translation of Nilsson's fishes, which he frequently refers to in his new work of "British Fishes," in describing the Ray's sea bream remarks: "So deeply impressed on my mind was the opinion of the probability that two specimens, which might have been supposed examples of the *Brama Rayii*, were in reality of different species, that I ventured to communicate to a local society of natural history of Penzance, a paper on the subject with figures, and the opinion thus formed has received some support from the observations of two eminent naturalists of Sweden, whose evidence will be reproduced at some length." He first describes *Brama Rayii* from a British specimen of 23 in. long, and then describes Fries' *pterycombus brama* as I have done, and then he adds: "How much of the discrepancy between this description and that

which I shall proceed to give of an example taken in Cornwall (figured below), can be ascribed to the confessedly mutilated condition of the northern fish, will only be a matter of opinion, but if finally it should be decided that they are only variations of one species, they form a new and remarkable portion of the history of this curious fish."

He then proceeds to describe the Cornish specimen which was 17 in. long and 5¼ in. deep, exclusive of the fins. His general description agrees in the main with Nilsson's, but he notices nothing of the peculiar position of the dorsal and anal fins. It is, I believe, the opinion of the northern icthyologists that this is a good and distinct species.

Fam. 6.—Scombridæ.

Gen. *Scomber*, L.

Number of finlets in front of the dorsal and anal fins five in each case, wide apart.

29. Scomber Scombrus, L. Mackrill. The Mackerel. D.

Is very common off the south-west coasts both of Sweden and Norway; rarer in the Sound and Baltic, where it is never met with in shoals, always as single individuals. The best fishery off these coasts is in the end of May or June, when the large shoals come in from their winter quarters in the depths of the North Sea into shallower water to spawn.

Referring to the coloured engravings of this fish both in Ekstrom's "Scandinavian Fishes" and Couch's "British Fishes," there is so marked a difference not only in the colouring of the two figures but in the shape of the fins, especially the dorsal and anal finlets, that, assuming both to be correct, one can hardly believe the two fishes to be identical.

The general length of the mackerel taken off these coasts is 16 to 18 in.; according to Ekstrom they, however, occasionally reach a length of 2 ft. They appear to become

smaller as they travel south, for off the coast of Scania they usually run three or four to the pound. Br. 7; D. 12 + 1,16; P. 18; V. 1,5; A. 1 + 1,10; C. 18.

Nilsson observes, it is not improbable that the Spanish mackerel has been taken here, and confounded with the young thunny, on account of the number of spurious finlets.

Gen. *Thynnus*, Cuv.

Finlets behind the dorsal and anal fins, nine; dorsals close together; pectorals large; a prominent ridge on the sides of the body near the tail, and a corslet of small scales on the breast.

30. THYNNUS VULGARIS, Cuv. Thon Fisk. The Thunny. D. Is not so very rare off the Gothenburg coast, but they generally run small, eight to ten inches long. It does not appear to go further north than the south of Norway, and only comes into the Sound accidentally, never in the Baltic. D. 14 + 1,13; P. 33; V. 1,5; A. 2,12. Colour never so handsome as in the mackerel.

Gen. *Xiphias*, L.

Nose elongated into a flat serrated bony sword, equal to one-third of the length of the body; one single dorsal high in front, but in old fish all the middle rays disappear, leaving a high fin in front over the pectorals, and another at the tail root like two fins; no ventrals, but the anal in the old fish appears divided into two, like the dorsal.

31. XIPHIAS GLADIUS, L. Svärdfisk. The Swordfish. D. Is nearly confined in these seas to the low sandy shores of South Sweden and Jutland. Nilsson remarks that all the specimens he has seen have been large, from eight to ten feet long.

Gen. *Caranx*, Cuv.

Body compressed, not round like the common mackerel; the curved lateral line armed with firm plates, forming a ridge along the sides; two distinct dorsals, with one spine before the first; a few spines before the anal fin.

32. Caranx trachurus, Cuv. Tägg Mackrill. The Horse Mackerel. D.

Is met with on most of the south-west coasts, from the Sound probably up to Bergen, in Norway. It is hardly known for certain whether they spawn in these seas, although small specimens of four to five inches long are frequently taken here in autumn.

The colour is not so rich as in the mackerel, and the back is much more arched; a black spot on the opercle. D. 8 + 1,32; P. 21; V. 1,5; A. 2 + 1,28; C. 17.

Gen. *Lampris*, Cuv.

One single dorsal very high in front; anal also elevated, the first ray of the latter spinous; body oval, compressed; no teeth; colours brilliant in the extreme, blue, purple, and gold; body over all covered with large oval silver spots; ventrals placed far back on the belly; root of the tail very thin; lateral line much curved; tail broad, deeply cloven; height of the body equal to more than one half of the length. Perhaps the most beautiful of all sea fish.

33. Lampris guttatus, Retz. Glanfisk. The Opan or King Fish. D.

Although considered strictly a southern species, this gorgeous fish has been, time out of mind, known all along the north and west coasts of Norway by the name of the "lase storje," or large salmon.

It has occasionally been taken on other Scandinavian coasts, from the very south even up to the North Cape, but never in the Baltic or in Greenland, or on the shores east of the North Cape. The stuffed specimen in the Lund museum from Christiania is three feet long.

I have had the pleasure of tasting this fish; the flesh was firm, white, and remarkably good. Br. 6; D. 50; P. 20; V. 14; A. 38; C. 20.

Fam. 7.—Tænioidei, Cuv. Riband Fishes.

Body elongated and very much compressed, like a riband; scales very small; one long dorsal; no anal fin.

Gen. *Trachypterus*, Gouan.

Body long, naked, compressed, like the blade of a sword, covered with a silvery gloss; snout projecting; eyes very large; one long dorsal, with a partially separate and high portion in front; tail distinct and well formed; not on a line with the body, but elevated; no anal; pectorals very small.

34. Trachypterus Arcticus, Nilss. Norsk Sölv Qveite. The Deal Fish. D.

The dimensions of the example which was sent down to Lund by Liljeborg from Tromsoe, in Norway, described by Nilsson, were as follows:—"Length from the point of the nose to the root of the tail 6 ft., of which the head was 9 in.; the height over the neck was 8 in., over the pectorals 10½ in., increasing gradually to about 34 in. from the point of the nose, where it is 14 in., whence it quickly diminishes, being only 1 in. when 4 in. from the root of the tail, and close to the tail 4 l.; colour; head blackish; mouth inwardly white; head and the right side of the body silvered all over; the two oblong black spots, which in the vaagmär (the Iceland deal fish, *T. Vogmarus*, Reinh.) lie wide apart on the sides near to the tail, are not seen in the *sölv qveite*, but in their stead there is a black band parallel with the upper edge, a little under the root of the tail; fins red; the left side nearly colourless grey, with scarcely a sign of silver gloss. Is said in Finmark to attain a length of six to ten feet.

Couch's figure certainly represents the Iceland fish, but in his description he says, "thrown on the shores of Iceland, Norway, and *Finland*." If, as Nilsson (and I believe correctly) supposes, that the Scandinavian fish is a different species from the Iceland vaagmär, Mr. Couch's *Trachypterus Arcticus*, Gunther, does not appear even to be met with on these coasts, certainly not at least the form as figured by him, and described in his book by Dr. Günther; for Nilsson, in describing the Norsk *sölv qveite*, says:—"This singular

fish is well known on all the coasts of Finmark by the fishermen there under the name of the '*solv qveite*, or silver flounder.' It is, nevertheless, rare, and is not seen every year, and, like most other rare fish, is principally found washed upon the strand after a storm. Its habitat appears to be peculiarly the icy seas, for it has never been taken on any other Scandinavian coast, save that of Finland;" but it appears, by Malmgren's list, that it never comes west of the North Cape. The Danish fish must be clearly the Iceland vaagmär, and if so, probably not identical with this.

Nilsson further remarks:—"The Iceland vaagmär (*T. vogmarus*, Reinh.) appears, after Reinhardt's description and figure, to differ from the Finland fish in the following particulars: In the Iceland fish both sides of the body are alike; the pupil of the eye circular; the fastenings of the pectorals directed towards the iris under the pupil of the eye; the rays of the long dorsal 172. In the Finland fish, the sides of the body are not alike; the pupil of the eye is vertically oval; the fastenings of the pectorals directed towards the middle of the space between the eye and the throat; the dorsal fin rays are 160."

But it is nearly impossible to decide which are distinct species, or what proper synonyme to use, from the mutilated fragments generally seen of all this class of fishes.

The Finland fishermen say that the sölv qveite, when living, is excessively fat, and more round on the sides, but that it is so oily that it runs out of it as soon as the fish is dead, on which account it becomes thinner and flatter; are generally sold to the Russians, who come to the north coasts of Finland from Archangel, and think much of oil.

Gen. *Gymnetrus*, Bl.

Body long, thin, compressed, and silvery, with a short blunt head and snub nose; lateral line smooth. Fins: one short and high, just behind the head; behind that a low fin, along the whole back, and joined to the caudal,

which, when present, forms the end of the tail, and is horizontal, not elevated, as in the last. Pectorals consist of one long ray each on the tip, flattened out to a web; no anal fin.

35. GYMNETRUS GRILLII, Lind. Norsk Sild Kung. Bank's Oar Fish (?).

Description of a fresh fish by Dr. Lindroth, which was washed up off Hitteren, near Trondtheim, in Norway, on the 12th August, 1797, the fragments of which are now preserved in the Stockholm Museum :—

"Body pointed, thin, sword-like, 18 ft. long, 14 in. high, and 3¼ in. thick; weight 180 lb.; colour silvery; skin rough, on account of four dark knotty and five paler smooth rows along the whole body, and a few transverse shades; head compressed, small, 7 in. high, 12 in. long, and 2 in. thick. The mouth was crushed, but it appeared as if the upper jaw had been a little shorter than the under. No teeth could be found. Eyes 2 in. in diameter, with silvery iris. Pectorals 2 in. long, and about the same in breadth; twelve rays. Ventrals, each consisting of a single ray of 5 ft. in length, rounded at the root, about as thick as a swan's quill, tapering gradually towards the end to a fine point, which appeared to have terminated with a flattened web, which was so much damaged that the number of rays could not rightly be seen. Colour bright red. The dorsal fin, which extended along the whole back, was highest at the head, 6 in.; in the middle of the back 4 in.; then gradually tapering off to the tail; its rays 406; its web thin, bright red, darkest at the outside margin, paler towards the back. The lateral line, which commenced at the upper edge of the eye, after that gradually sank down two-thirds of the fish's height, and continued thence along the body in a straight line to the point of the tail. The whole of this lateral line was in appearance like a cable with links, four lines long, or oblong scales of one line broad, which sat loose and thin on the skin. The tail fin was broken off."

Nilsson adds that at the fishing station of Glesnäs, which

lies on the Isle of Glesvär, 3½ miles (Norsk) south of Bergen, this fish is caught oftener than in any other place. We have now records of the capture of five examples between 1740 and 1798, and none seem to have been taken since. The longest of these appears to have been one taken off Bergen in 1791, and measured 42 ft. This was named by Lindroth *G. ascanii*, and was described in the Bergen "Adress Avis" for 1791, under the name of *trichurus lepturus*. The description of this last specimen is unfortunately lost. The dorsal in this was joined on to the tail; otherwise it appears to have had the same long band on the body as the one described. The head was short and blunt, with "*visible and strong teeth.*"

It seems that Dr. Günther believes this Norsk "sild kung," or king of the herrings, to be a different fish from the Bank's oar fish (and the same opinion prevails here); and he further fancies it to be the *regalecus glesne* of authors. (Couch.)

This fish appears to be altogether confined to the north and west coasts of Norway, but is even more rare than the last. All the Fin fishermen well know the difference between the solv qveite and sild kung. The latter is much more slender in proportion to its length; and the specimens which of late years have been seen have all been longer. Few fishermen have seen this fish, but most have seen the *sölv qveite;* and yet it is singular that neither this nor the last are included in Malmgren's list.

Fam. 8.—Mugilidæ.

Body cylindrical, as well as the head covered wholly with large hard scales; mouth transverse, angular; two dorsals, the first with four spiny rays; no barbules under the chin; ventrals behind the pectorals.

Gen. *Mullus*, L.

Largish sea fish. Head scaly; body not mailed; form not unlike the chub; depth of the body about one-fourth of its length; two dorsals, high, short, wide apart, the first spiny;

gill covers smooth on the margins; mouth small; no barbules. May be distinguished by the dark longitudinal lines which run along the sides, and the large hard stout scales.

36. Mugil capito, Cuv. Grå Multe. The Grey Mullet. D. Is met with on the coast of Bergen at all seasons of the year, but not elsewhere in these seas. Length often 2 ft.; colour bottle green; lighter on the sides, which are streaked with about seven longitudinal dark lines. D. 4 + 1,7; A. 2,10; P. 17; V. 1,5; C. 19.

37. M. Chelo, Cuv. Tjöck Läppäd Multe. The Short Grey Mullet; the Thick-lipped Mullet.

Is taken both on the south-west coast of Norway, where it is said to remain throughout the year, and also off Bohus Land, in the south-west of Sweden, where, according to Ekstrom, it is more common of late years. It is so like the last that it is doubtful whether it can be considered a distinct species. It is, however, smaller in all its proportions, but the principal difference consists in the different shape of the gill covers and mouth. The latter, instead of, as in the grey mullet, being hard and not swelled, is in this fish swelled, fleshy, and soft. When seen from below the edges of the gill covers do not, in *M. capito*, hide the space under the tongue; in *M. chelo* they do. But, as Dr. Günther observes, "the *lateral* view of the head alone is a just representation of the fish described."

Fam. 9.—Blennioidei.

Body slimy; scales very small, or altogether absent; one or two dorsals, with single rays, sometimes weak, sometimes stiff and pointed; head short; forehead sloping.

All small dull-coloured sea fish, living on the bottom.

1. Ventrals apart, small; few or no rays. Tånglakar, Sw.

Gen. *Pholis*, Flem.

Forehead smooth, without tubercles; body covered with a slimy skin; no scales; one long dorsal and anal fin; pec-

torals broad; ventrals small, but divided; tail rounded; dorsal with thirty-one, anal with twenty rays.

38. PHOLIS LÆVIS, Flem. Skygg Fisk. The Shanny.

Body round, elongated; usual length here 6 in. to 7 in. Colour varies, but generally olive green, marbled with dark brown. D. 12,19; A. 20; P. 13; V. 1,3; C. 15.

The coast of Bergen, in Norway, is the only place in these seas where the shanny has yet been taken.

Gen. *Blenniops*, Nilss.

Two pair of tentacles on the forehead; dorsal rays fifty, anal forty; body more slender than the last, covered with small scales. The long dorsal joins the sharp-pointed tail.

39. BLENNIOPS GALERITA, Nilss. Tång Snärta. The Crested Blenny; Garrell's Blenny.

Is not very rare on the Norwegian coast north and south of Bergen, but is found nowhere else in these seas. D. 51; P. 14; A. 40; V. 1,3; C. 18. Colour varies, but is always mottled like the last. Length 7 in.

Gen. *Lumpenus*, Reinh.

Of these fish Nilsson remarks—"They are so totally unlike any others of this family, that at the first glance it is easy to see that they form a separate genus. Fries has described two Scandinavian species as belonging to this genus under the name of *clinus*. According to him, we ought entirely to lay aside the generic name of *lumpenus*, because *Blen. lumpenus*, L., is no other than a nominal species which belongs to *zoarcœus viviparus*. But as the generic name of *lumpenus* has already been adopted by many, I think it best to retain it."

Body long, resembling that of the common gunnel, more round than compressed, covered with small thin scales, laid on like shingles. Nose projecting, blunt; gape horizontal; teeth in the jaws, awl shaped; on the sides in a thin single row, but in front, on the top jaw, in several rows, of which

the outer ones are largest. A single dorsal fin extending along the whole back, beginning with very low spines, separated from each other, with all the rays sharp. The ventrals, which are placed a little before the pectorals, are very small and pointed, consisting only of one spiny, and three weak rays, all grown together at the points. Anal fin, which commences in front of the middle of the body, often on the front third division, reaches nearly to the caudal fin, and consists of jointed weak rays. Tail distinct. Gill openings large, with six rays; the gill membrane under the throat free, forms a pointed angle.

[He divides this genus into two sub-genera.

1.—*Ctenodon*, Nilss.

Teeth on the jaws, vomer, and gums; two canine teeth in the jaws above and below. To this belongs *clinus maculatus*, Fries; *lumpenus aculeatus*, Reinh.

2.—*Lumpenus*, Nilss.

Teeth only on the jaws; none on the vomer or gums; no canine teeth. To this belongs *clinus nebulosus*, Fries; *blennius gracilis*, Stuvitz.]

40. Lumpenus Maculatus, F. Trubbstjertad Långbarn. (Blunt-tailed.)

The under division of the pectorals longer than the upper, with free rays; tail rounded; dorsal rays about sixty, of which the first consists of very low distinct spines; rays in the anal fin thirty-six or thirty-seven. Colour of the living specimen taken by Fries: body dirty yellow; sides, above the lateral line, covered with several large irregular yellowish brown spots, with dark brown edges; head with a yellow tinge, and dark spots on the upper part; iris whitish, with a broad reddish brown ring around it; dorsal fin pale, with nine to eleven oblique wavy streaks and rows of small round brown spots; anal and ventral fins pale unspotted; caudal and pectoral fins with smaller

spots on the rays, forming distinct transverse bands. Br. 6; D. 59; P. 10 + 5; V. 1,3; A. 37; C. 13.

A specimen from the Bohus Land coast was 6 in. long; its greatest height, under the pectorals, 4½ l.; its greatest thickness 3 l.

This fish, which had been previously taken on the coast of North Greenland, has as yet only been discovered in one place on the Scandinavian coasts, namely, on the Bohus Land, Skargärd, not far from Gothenburg, where, according to Fries, it is only met with in October, November, and December. They do not appear to go in shoals, for even during the spawning season they are never taken in any great numbers, but only one or two in each cast of the net. They lie chiefly on the bottom, with the body stretched out and the pectorals spread. Food: crustacea and small animals. Spawning season: the beginning of winter, when the fish are in pairs.

41. Lumpenus Nebulosus, Fries. Spetssjertadt Långbarn. (Sharp-tailed.)

Pectorals oval, with the upper and lower rays shortest, and without any free rays; tail lancet shaped; rays in the dorsal fin about 70, in the anal fin 50; more slender than the last, which it otherwise resembles, in habits and appearance; colour orange yellow, marbled with brown; fins reddish.

Is met with sparingly along the west and north coasts of Scandinavia; has been several times taken in Christiana Fjord, in Norway, and once on the Bohus Land coast, in Sweden; seems to become more common further north, and is met with both in Iceland and Greenland. The spawning season is about Christmas. The general length is 8 to 9 in., sometimes 12 in.

Nilsson remarks that of this fish they have on the west coast of Scandinavia two distinct forms; the one is met with from the Bohus Land coast to the North Cape, the other on the coast of Christiania; but although they differ in the size of the relative proportions of body, there scarcely

exists any constant mark of distinction which can lead us to suppose they are two distinct species.

Gen. *Gunellus*, Cuv.

Body very long and compressed, smooth and slippery; head small; nose sharp; dorsal fin long, with all the rays sharp and single; tail free; pectorals consist of one spike, and one weak ray, joined together; teeth in several rows; height of the body equal to one-ninth of the length.

42. GUNELLUS VULGARIS, Cuv. Svart Fläckig Tejstefisk. The Spotted Gunnel. D.

Distinguished by the ten round black spots along the top of the back, each encircled with a white ring; the Scandinavian specimens rarely exceed 8 in.

These fish derive their Swedish name from the fact of their affording food to the black *guillemot*, called in Swedish "tjesto."

Is met with along all the Scandinavian coasts, from the Sound at least up to Trömsoe, near the North Cape; common in West Finland; spawns in November; colour brown-yellow. D. 78; A. 2,42; P. 12; V. 1,1; C. 18.

Gen. *Zoarcæus*, Cuv.

Body slimy; both the anal and dorsal fins are joined on to the tail; ventrals before the pectorals.

43. ZOARCÆUS VIVIPARUS, Cuv. Tang Lake. The Viviparous Blenny. D. F.

In shape much resembles the burbot, whence its Swedish name of *tång lake*.

Is met with pretty commonly on every Scandinavian coast; length from 12 in. to 16 in.; brings forth living young at no one particular season of the year, probably dependent upon the age of the fish; body colour yellow-brown, with black spots on the sides, and yellow anal fin; D. 100; A. 70; P. 19; V. 3.

Gen. *Anarrhichas*, L.

Body slimy, deep in front, with protruding abdomen tapering very much to the tail; head blunt, rounded;

forehead very sloping; strong conical front teeth, and low round molars; tail distinct; no ventral fins; one dorsal.

44. Anarrhichas Lupus, L. Vanlig Hafkatt. The Wolf Fish. D. F.

Is met with on all the Scandinavian coasts, far up into Norway, never in shoals, but as they are caught in the same places at all seasons of the year, there is no reason to suppose they are migratory. Their usual length here is from 3 to 4 ft.; spawn in May and June. Colour grey-brown; sides transversely banded with dark brown; a yellow ring round the pupil of the eye; dorsal 62 to 77 rays; anal 43 to 45; all the fin rays weak.

2. Ventrals apart, very broad. Sjö Kockar, Sw.

Gen. *Callionymus*, L.

Body smooth, without scales; preopercle spined; two dorsals; ventrals irregular; fins very large; eyes close together; gills hardly apparent, formed only by a little round opening on each side of the neck; the males are much handsomer than the females, and the shape of the fins is different.

45. Callionymus Lyra, L. Vånlig Sjökock. The Gemmeous Dragonet. D.

Head ablong ovate, measuring in a fish of 10 in. $2\frac{1}{4}$ in. in length, and $1\frac{1}{4}$ in. in breadth; hinder dorsal covered with several horizontal bands of pale blue-green and yellow; body yellow, striped and spotted with blue; the female yellow-brown spotted. Male: the front dorsal fin very high, the first ray being so long as to overlap the tail; yellow with blue longitudinal streaks. Female: the front dorsal fin lowest; the web between the three last rays black.

Nilsson considers the *callionymus dranunculus*, L., or sordid dragonet of British authors, as nothing more than the female of *C. lyra*, L. The male is always the largest, often measuring 10 to 12 in. D. 4+10; A. 10; V. 1,5; P. 18;

C. 10. Is met with along the coasts of the Cattegat and North Sea. Not rare, but no where very common, and never in any quantities. Like many other fish, they live in a state of monogamy, and copulate when they come up from the deeps in November and December to spawn. The flesh is never eaten here. They are sometimes taken on a hook, but generally in nets.

46. Callionymus Maculatus, Raf. Fläckig Sjökock. D.

The hinder dorsal fin is high and pointed, but will not reach back to the root of the tail; colour yellowish green, with round spots in several horizontal rows; rarely exceeds 6 in. in length.

This handsome little fish, whose peculiar home is in the Mediterranean, has been taken both in the Sound and off the Bohus Land coast, in summer and winter, but female fish have never been caught here.

Colour green-yellow, with small red-brown and pale blue spots; four parallel rows of round green spots on the hinder dorsal. Fin ray formula as in the last.

43. Ventrals grown together into an oblique, funnel-shaped hollow. Smör Bultar, Sw.

Gen. *Gobius*, L.

Sea Fish, with Slimy Bodies.

Body large; long thick scales, all small dull coloured; easily recognized by the peculiar form of the ventrals, the short anterior rays and the long posterior ones on each side being united together, forming a hollow sucker with which they possess the power of attaching themselves to rocks.

47. Gobius niger, L. Svart Smörbult. The Black Goby. D. F.

Dorsals (the first spinous) near together; the points of the anterior ones reaching, when the fin is laid back, to the root of the tail; tail rounded; jaws of equal length; length 3 to 6 in.; the largest of the genus.

Is never met with on the sandy coasts of South Sweden, but is common in the upper parts of the Baltic as well as in the Cattegat and North Sea. Spawns in May; colour deep, olive brown, variegated; a row of small black spots along the sides. D. 6 + 1,12; P. 19; V. 1,5—1,5; A. 1,12.

48. G. MINUTUS, Gm. Hitaktag Smörbult. The One-spotted Goby. D. F.

Dorsals wide apart; rays 6 + 12; the points of the anterior ones do not reach half way to the root of the tail when laid back; tail square; under jaw longest; a black spot on the first dorsal; length 2 to 4 in; colour whitish grey, tinged with yellow; back finely spotted.

Is met with in the Baltic, Cattegat, and North Sea, but is always small in the Baltic. The spawning season here seems very irregular, for we meet with small individuals on these coasts all through the summer. Both these species are very rare in Finland.

49. G. GRACILIS, Jen. Spetsstjertad Smörbult. The Slender Goby.

Dorsals distinct; rays 6 + 15; tail pointed in the middle; eyes close together; much resembles the last, but more elongated and slender. One single example of this fish has been taken in the deep Gullmare Fjord, Norway, in January. D. 6,15; A. 13; C. 25.

When living, must be the handsomest of all the gobies, with rows of red spots on a yellowish bottom.

50. G. RUTHENSPARRI, Euph. Sjuströlig Smörbult. The Double-spotted Goby. D.

Closely resembles the black goby, but is the smallest of the genus, scarcely 2 in. long; dorsals wide apart; tail square; colour light brown; the two spots on each side, one at the tail root, the other close to the pectorals, will distinguish this from *G. minutus*; under jaw the longest.

Is met with in great quantities both in the Cattegat and

North Sea, but never in the Baltic. Spawns in the summer. D. 7 + 1,10; A. 1,10; P. 17; V. 1,4 + 1,4.

51. G. Nilsonii, Dub. and Kor. Två Strålig Smörbult.
Tail rounded in the middle; dorsals wide apart; fin rays D. 2 + 20; P. 30; A. 20; C. 31. Sides covered with 28 to 30 deep muscular furrows.

Several examples of this new species have been taken off the west coast of Norway, both in the summer and winter, in thirty fathoms depth. None were two inches long, and all transparent, and might have been nothing more than young fish of some larger species; but this seems hardly probable when we compare the number of fin rays with all the other known species.

52. G. Stuvitzii, Dub and Kor. Fem Strålig Smörbult. The White Goby (?).
Fin rays: D. 5 + 12; P. 15; A. 14.

Resembles the white goby in all respects, save that the hindmost rays in the back dorsal and anal fins gradually decrease in length behind, and when laid down do not reach half way to the root of the tail fin. Has been caught off Bergen in December, but all were young fish, scarcely two inches long.

Discoboli. Sucking Fish.

4. Ventrals united, forming a concave disk or sucker beneath the naked body. Sug Fiskar, Sw.

Gen. *Cyclopterus*, L.

Body thick and solid, with a fatty ridge on the top of the back; skin rough, covered with knotty warts; pectorals large, united under the throat; the first dorsal scarcely perceptible.

53. Cyclopterus Lumpus, L. Stenbit. The Lump Sucker. Red Lump (male), Blue Lump (female). F. D.
The northern examples of this fish rarely exceed 1 ft.

4 in. The males are always larger than the females. They live in a state of monogamy, and an actual pairing is said to take place between the two sexes; spawn in March; colour blackish grey; edges of fins red; all the rays covered with thick skin. D. 11; P. 28; A. 9; C. 11.

Tolerably common in some parts of the Baltic (but never on its Swedish shores), the Cattegat and the North Sea, to far up on the coast of Finland. A specimen 16 in. long will be 8 in. deep and 4 in. wide.

Gen. *Liparis*, Art.

Smaller fish; one dorsal fin; body smooth; in form like the black goby.

54. LIPARIS BARBATUS, Ekst. Större Lumpfisk. The Sea Snail. F. D.

Nilsson remarks that these fish seem to be identical with the lumpsucker in a lower stage of development, and he can see no other generic difference between a full-grown *liparis montagui* and a young *cyclopterus lumpus*, which has not yet obtained its knotty skin, than that the former has one, the latter two dorsal fins.

This species is larger than the next, measuring 7 to 8 in., whereas Montague's sucker rarely exceeds 3 in. The principal difference is in the shape of the pectorals, and the length of the dorsal and anal fins. In the sea snail they both are joined to the square tail one-third of its length. In Montague's sucker the last ray of the dorsal does not reach to the root of the tail-fin, but the anal fin is joined to the pointed tail. Colour reddish grey, covered with broad irregular black spots. Is rare on the Scandinavian coasts, and has hitherto been taken only in the Baltic off the shores of Stockholm and Œster Gothland. D. 35; A. 27; P. 27; C. 12.

55. L. MONTAGUI, Yarr. Mindre Lumpfisk. Montague's Sucker. D.

Is never met with in the Baltic, but is not rare on

the western coast of Scandinavia, from the Sound up to Bergen, in Norway, and probably further north. Colour dull orange; belly dirty yellow; all the fins with a blueish tint; length 3 in. D. 30; A. 24; P. 28; C. 14.

Gen. *Lepidogaster.*

The sucking organ divided into two portions; pectorals very large; one dorsal; cirri before the eyes.

56. LEPIDOGASTER BIMACULATUS, Pen. Tvåfläckad Dubbel Sugare. The Double-spotted Sucker.

The smaliest of the genus, rarely 3 in. long. The single dorsal and anal fins each with six rays, and both divided from the caudal fin; pectorals very broad; a round purple spot behind each pectoral, and a double cirrus before each eye; colour purple brown, with minute spots.

This pretty little sucker was added to the Scandinavian fauna from a specimen taken by Baron v. Duben, on the west coast of Norway, at a depth of thirty fathoms.

The *L. cornubiensis*, Jen. (or Cornish sucker) has not yet been detected in these seas. It rather resembles the last, but is larger, and the dorsal and anal fins are united with the caudal.

Fam. 10.—PEDUNCULATI, Cuv.

Body naked, small, and tapering; head enormous; pectorals fleshy and horizontal; mouth wide.

Gen. *Lophius*, Art.

Ventrals like feet; gill opening behind the small pectorals; on the head are three long separate moveable tendrils, distinct from the dorsal fins, which are two in number; skin without scales; ventrals before pectorals; the branchiostegous rays form a purse under the chin.

57. LOPHIUS PISCATORIUS, L. Vanlig Marulk. The Fishing Frog. D.

Is met with in all the Scandinavian seas (except on

the Swedish coast of the Baltic), from the Sound up to the North Cape; said sometimes here to attain a length of five feet; colour grey above, marbled with brown and black. D. 3 + 11; P. 23; V. 1,5; A. 8; C. 8.

58. Lothius eurypterus, Dub. and Kor. Bredfenad Marulk.

Head more broad than long, tapering to snout; pectorals large, much more broad than long; the first tendril on the head short, ending in a transverse soft cylinder; ventrals spread out like a fan, with six rays; length 4 in. D. 3 + 12; P. 27; V. 1,5; A. 11; C. 8.

Only about three specimens of this little fish have been taken here, and all on the west coast of Norway. Concerning its habits Baron v. Duben observes:—"In a shell filled with salt water one of these little fish lived for two days, and would stand right up in the shell, or swim to and fro, often on its back, rooting with its nose in the bottom." Colour above speckled with grey and brown; below white.

Gen. *Batrachus*, Schneid.

Head broader than the body, compressed; gill coverts furnished with spines; pectorals broad, placed on short fleshy arms; ventrals under the throat small and pointed; two dorsals, the first short, with thick spiny rays, the hinder long, with soft rays. In many respects forms a transition to the last.

59. Batrachus borealis, Nilss. Nordisk Paddfisk.

In shape something like the last, but without the filaments on the head; body compressed, long, tapering off to the tail, smooth, covered with small round thin scales; suboperculum with only one spine; dorsal fin rays twenty. The length of the Swedish specimen was 8 in. This was taken off Kullen, in the Cattegat, in 1820. Colour dark brown; greyish on the sides and head. D. 3 + 20; A. 16; P. 21; V. 1,2; C. 13.

It has lately been disputed whether this fish has any right to a place in this fauna, and some contend that the specimen sent in to the Lund Museum had been purchased of an

American skipper. But this, as Nilsson observes, is scarcely probable, for the specimen, when he described it, was so fresh that the natural colours remained. Moreover, in the stomach, which he preserved in spirits, were found remains of *cancer depurator* and *buccinum reticulatum*, both of which are common off Kullen, where this fish was taken.

This fish, as Nilsson observes, stands very near to, if it is not identical with, the *Gadus Tan.*, Bloch 57.

Gen. *Chironectes*, Cuv.

Small fish, principally confined to the warmer seas. Head and body both compressed; skin naked, full of round slimy openings; three spinous rays above the head; dorsal supported by soft rays.

60. Chironectes Arcticus, Dub. and Kor.

The only specimen of this fish that has been met with in the Scandinavian seas was taken off Vardoehus, near the North Cape, in 1826. Most probably, like the other tropical fish which are taken in the northern seas, it had been carried on to these shores by the agency of the Gulf Stream. It was $1\frac{1}{4}$ in. long, $\frac{1}{4}$ in. high. D. 12; P. 10; V. 5; A. 7; C. 10. Colour grey-brown, marbled; eye bright yellow.

Fam. 11.—Labridæ, Cuv.

Body oblong, scaly; one long dorsal; the spines invested in a membrane; lips fleshy and projecting; tail broad, rounded on the margin.

"These fishes," as Wood so truly and prettily observes, in his "Illustrated Natural History," "are not only remarkable for the full fleshiness of their evidently sensitive lips, but for the endless variety of rich and vivid tints with which their bodies are decorated—hues pure as the bright patterns of cathedral windows, and often arranged with a symmetrical regularity of outline and a daring harmony of contrasting colours. Even on our own coasts the *labridæ* are most

lovely creatures, but it is in the tropical and warmer seas of the world that they are to be seen in their full brilliancy. No artist can transfer to paper the radiant hues that glow on these favoured members of the finny race, and no pen can do justice to their wondrous splendour as they dart through the crystalline waters like living meteors, or leisurely traverse the forests of moving *algæ*, balancing themselves among the submarine foliage, like humming birds of the sea."

Gen. *Labrus*, Cuv.

The smooth edge of the opercle distinguishes this genus from *crenilabrus*.

61. LABRUS MACULATUS, Bl. Berg Gylta. The Ballan Wrasse. D.

The largest of the genus, and frequently taken in the North Sea 18 in. long, and weighing 7 to 8 lb. Is met with on all the western coasts of Sweden and Norway, from the Sound up to Bergen, but not in the Baltic. Spawns in May. Form of the body oblong oval. Colour varies much, but is either green, yellow, or red; always lively. Hinder rays of the dorsal much elevated and rounded off, as is also the case with the anal; so that both these fins appear to end in a rounded lobe. D. 20,10; P. 15; A. 3,9; V. 1,5; C. 14.

Couch fancies that Yarrell's "corkwing" is only the young of this.

62. L. MIXTUS, L.; L. DISPAR, Fries. Blå Gylta. The Cook Wrasse (male); the Three-spotted Wrasse (female). D.

The male is one of the most beautiful of the Scandinavian fishes; prevailing colour red-yellow, streaked and marked with blue. The female and young males reddish brown, with three large round black spots on the upper part of the back. Body more slender and elongated, nose longer and sharper, than in the last. Usual length 12 in. to 14 in.; dorsal fin of an equal

length throughout. D. 17,13; P. 15; V. 1,5; A. 3,10; C. 11.

Is met with in all the seas on the western coast, from Bohus Land at least up to Söndmor, in Norway, but not in the Sound or Baltic. None of the wrasses are known on the coasts of Finland.

Gen. *Crenilabrus*, Cuv.

Preopercle denticulated on the hinder margin.

63. CRENILABRUS MELOPS, Cuv. Skär Rone. The Cork-wing. D.

General appearance that of the *labrus*, but the body is deeper. A black spot at the root of the tail, and another at the back of the eye; but these are not always constant. The general length of the Swedish examples 8 in. to 9 in. Spawns here in July; and Kroyer fancies that an actual pairing takes place between the sexes, but that the female directly after deposits the fructified eggs. Colour of the living fish resembles a yellow-brown net over a pale blue bottom. This puzzling species is by no means rare on the western coasts, from the Sound up to Söndmor, in Norway, 62° north lat. D. 16,9; P. 15; V. 1,5; A. 3,10; C. 14.

Gen. *Ctenolabrus*, Val.

Preopercle denticulated only on part of its margin.

64. CTENOLABRUS RUPESTRIS, Val. Berg Smeltra. Jago's Gold Sinny. D.

Fins all of one colour; a black spot over the root of the tail fin, and another at the commencement of the dorsal; form more elongated than in the others.

Is one of the smallest of the northern wrasses, barely exceeding 5 in.; but it is also the commonest on all the western coast, from the Sound to far up in Norway.

According to Nilsson, this species not only frequents brackish water, but is even occasionally taken far up in rivers on the coast.

This is the least handsome of all. Colour usually greenish grey, with indistinct dark transverse bands; iris blood red. D. 17,9; P. 15; A. 3,7; C. 15.

Gen. *Acantholabrus*, Val.

Five spiny rays in the anal fin (no other northern species has more than three); preopercle denticulated all along the hinder margin.

65. ACANTHOLABRUS EXOLETUS, Cuv. Små Munt Smeltra. The Rock Cook; The Small-mouthed Wrasse.

Generally about 5 in. long, and is the rarest of all the Scandinavian wrasses, from all of which it may be distinguished by its very small mouth; the height of the body more than equal to the length of the head. D. 18,7; A. 5,7; P. 13; V. 1,5; C. 15. Colour when just caught olive brown; belly whitish; sides of the head yellow-brown, with longitudinal blue bands.

MALACOPTERYGII. SOFT-FINNED FISHES.

All the fin rays (with the exception sometimes of the first in the dorsals and pectorals) soft and cartilaginous, mostly divided at the points.

Division 1.—ABDOMINALES.

The ventrals suspended from the abdomen, and placed far behind the pectorals.

Nearly all the Scandinavian fresh-water fish belong to this order.

Fam. 1.—CYPRINIDÆ.

Body well shaped, covered with round scales; one dorsal and one anal fin; mouth small, without teeth, which lie in the throat. They are all fresh-water fish, properly speaking, although many of them can live in brackish water. Their food consists of vegetable matter, larvæ, and insects. No member of this family has more than three rays on the branchiostegous membrane.

Gen. *Cyprinus*, L.

Dorsal long; anal short; one of the foremost rays in each thick, and doubly serrated in the hinder edge; teeth in the gullet flat.

Body more or less arched and compressed, with large hard scales.

A.—*Cyprinus*, Cuv.

66. Cyprinus Carpio, L. Karp. The Carp. D. F.

Two barbs on each side of the mouth; tail forked; common in some still waters in the south of Sweden, where it was imported about the year 1560; length 1 to 2 feet; colour olive-brown, tinged with gold. D. 4,20; P. 16; V. 9; A. 3,6; C. 19. Lateral line scales 35.

B.—*Carassius*, Nilss.

67. A.—Cyprinus Carassius, Bl. Sjö Ruda. The Crucian Carp.

Is the broadest in shape of all the genus. No barbs at the mouth; tail crescent shaped; colour as in the last. D. 2,20; A. 2,7; P. 15; V. 9.

Is much more abundant in Scandinavia than the common carp, and goes much further north. Is met with in the middle of Sweden, as well as Norway, and in Finland; goes up as far north as at least 64° north lat. Length 12 to 14 in.

Kroyer acknowledges only one distinct species in Denmark, the *Carassius vulgaris*, Kroy., and Malmgren does the same.

B.—Cyprinus Gibelio, Bl. Damm Ruda. The Prussian Carp.

Is met with in lakes and ponds from the far south of Sweden, right up into Lulea Lapland; and I have seen specimens from the River Klar.

According to Ekstrom this is nothing more than a

degenerated form of the Crucian carp, and I think he is right.

Tinca, L.

Dorsal and anal fins short; mouth with two short barbs; body tolerably high, covered with small slimy scales; all the fins thick, fleshy, and rounded off; teeth in the gullet flat.

Body colour dark, with a bronze metal gloss. D. 13; A. 11; P. 18; V. 10.

68. TINCA VULGARIS, Cuv. Sutare. The Tench. D. F.

Is common in many places in the south and middle of Sweden; and is met with in the grassy bays on the western coast of the middle of the Baltic. In Finland, goes up to about 52° north lat. Length 12 to 18 in.

Gobio, Cuv.

Dorsal short; anal long; mouth with two barbs; body round, covered with large scales; tail cloven; teeth in the gullet pointed.

Sides of the body, as well as dorsal and anal fins, covered with small dark spots. Body elongated; small fresh-water fish. D. 10; A. 8.

69. GOBIO FLUVIATILIS, Will. Sandkrypare. The Gudgeon. D. F.

Is certainly a very rare fish in Sweden, and one which I never met with. It is, however, taken in some places in the very south; only one specimen has ever been taken in Finland, on the coast near Vyborg. Usual length 6 to 8 in; swims in shoals.

Leuciscus, Klein. *Squalius*, Bon.

Dorsal short; anal short; mouth without barbs; body either lengthened, or else very high and compressed.

The following table of fin ray formulæ, position of the

dorsal fin, and number of scales on the lateral line, may be useful in distinguishing the different members of some of the genera of this genus :—

a. Dorsal fin placed directly over the ventrals. *Leuciscus grislagine,* D. 10, A. 11 ; scales on lateral line 52. *L. idus,* D. 11, A. 13 ; scales on lateral line 55 to 60. *L. rutilus,* D. 11, A. 12 ; scales on lateral line 42 to 44.

b. Dorsal commencing above the termination of ventrals. *L. latifrons,* D. 11, A. 12 ; scales on lateral line 45.

c. Dorsal placed behind the ventrals, but before the anal fin. *L. erythrophthalmus,* D. 11, A. 1,4 ; scales on lateral line 42.

d. Dorsal standing over the space between the ventrals and anal fin. *L. phoxinus,* D. 9, A. 9.

Unlike all the previously described members of this family, the fish belonging to this genus do not lie grovelling at the bottom of the water, but are quick and lively in their motions, preferring clear water.

70. Leuciscus Grislagine, Art. ; Cyprinus Grislagine, Fries and Ekst. ; C. Leuciscus, L. Stämm. The Dace. D. F.

Much confusion has existed respecting the identity of this fish, and the many different synonymes which have been used by different authors, have only tended to add to, instead of diminish it. I think we may now take it for granted, that the Swedish "stämm" is no other than the common British dace, and that the *Cyprinus dobula* of Kroyer's "Danish Fishes," the *Leuciscus dobula* of Yarrell, as well as that author's *Leuciscus vulgaris* and *Leuciscus Lancastriensis,* are all different forms of and identical with the *Cyprinus Grislagine,* or "Stämm" of Swedish authors.

Is common in the middle and north of Sweden, as well as in Norway and Finland. I never saw an example more than 8 in. in length. They spawn with us in May.

Colour of our "Stämm" brownish, silvery on the sides; white abdomen; all the lower fins with a reddish tinge.

71. Leuciscus Idus, Cuv. Vanlig Id. The Ide. D. F.

May be at once distinguished from the chub by its much smaller scales, and the different shape of the anal fin, which in the ide is square or rather indented, in the chub rounded off. Kroyer appears to doubt whether the British ide is identical with the northern fish.

The ide is a very common fish in Scandinavia, from the south of Sweden, at least as far up as Karesuando in Lapland, and the commonest of all the fresh-water fish in Finland. They delight in clear and running water. Many winter in the brackish bays of the Baltic, but they all come up into fresh water to spawn, about the end of April. Here they attain a good size, an ide of 5 or 6 lb. not being uncommon, and they are even said to become larger. They will take a bait spinning. In habits they rather resemble the British chub, but are far better eating. I do not see why this fish should not be introduced into the British waters, with profit, for I fancy they would thrive in any chub water, and it is certainly a far better fish than the chub.

The specimen described by Nilsson was 17 in. long, 4½ in. high, weighing 2½ lb.

72. Leuciscus Cephalus, Flem.; Cyprinus Cephalus, L.; C. Jeses, Wright and Ekst. (with a beautiful figure); C. Idus, Bl.; Leuciscus Dobula, Cuv. and Val.; L. Latifrons, Nilss.; Squalius Dobula, Heck.; S. Cephalus, Leib. The Chub, Yarr. Färna; Bred pannad Id.; Karnel Id, Wenern, Sw. F.

Much confusion has existed in the identification of the chub, the dobule roach, and the dace; but I believe the synonymes which I have given all properly belong to this fish. It was a matter of doubt for a long

time whether our British chub was an inhabitant of the Scandinavian waters. It is now, however, clearly proved that such is the case, and, according to Malmgren, all the different synonymes quoted belong to this fish and no other. Although found in many of the Scandinavian waters (especially in the middle of the country), and even far up in Finland, where they attain a weight of 8 to 10 lb., it is, I fancy, nowhere so common as the ide, nor does it (in Wermland at least) run to so large in size, although Ekstrom mentions having seen one 22 inches long, and another weighing 7 to 8 lb. But Nilsson gives the general size as 8 to 10 in. in length, and this is, I think, pretty correct, certainly in the northern tract of the Wenern. They spawn here in June. Is not included in the list of Danish fishes, unless it goes under the synonyme of *L. Dobula* or *L. Grislagine*, which I fancy is not the case. It is singular, however, that Mr. Lloyd gives us a figure of the dobule roach in his "Scandinavian Adventures," and remarks: "The dobule roach, or what Mr. Yarrell, who examined several specimens brought home from the Wener, and myself considered to be such, was common as well in that lake as in the Gotha." This does not agree with Malmgren, who denies the existence of the dobule roach, as a distinct species, in either Britain, Denmark, or Sweden. It is my opinion that the confusion respecting the identity of some of the different members of this genus is not cleared up, and I do not believe that we have the true dobule in Sweden.

73. Leuciscus Erythrophthalmus, Cuv. Sarf. The Rudd.
D. F.

Is very common in the south and middle both of Sweden and Norway, but I believe it is not ascertained precisely how far north it is met with. They spawn here early in June. Their general length is about 8 in., but I have seen them larger; may always be known from the roach by the deeper body, the bright vermilion fins, and the carp-like colour of the scales.

74. Leuciscus Rutilus, Cuv. Mört. The Roach. F. D.

Is certainly the commonest of all the genus, and is met with from the extreme south of Scania far up into Lapland. They run to a large size, a roach of a foot long not being so very uncommon. They say here that the male fish appears on the spawning grounds a fortnight before the females; and the fishermen call the former the "Is mort," the latter the "lek" or "löf mört." They generally spawn about the beginning of May. I hardly believe that we have two distinct species of roach here, but certainly the very differently-coloured fish we take in distinct waters would almost favour this supposition.

75. Leuciscus Phoxinus, Cuv. Elritza. The Minnow. D. F.

Is met with in all little streams, and in many of the large lakes, from the extreme south of Sweden far up into Norway. Usual length 3 to 4 in., but I have taken them in Wermland more than 5 in. Is common in the brackish waters of the Gulfs of Finland and Bothnia.

Gen. *Abramis*, Cuv.

Dorsal short; anal long, with always at least six more rays than in the dorsal; mouth without barbs; body generally high and compressed.

A.—Upper jaw longest.

a. Dorsal fin placed directly over the ventrals. *Abramis wimba*, D. 11, A. 22,23; scales on lateral line 60.

b. Dorsal behind ventrals; ends in front of the anal fin. *A. bjorkna*, D. 11, A. 24,25; scales on lateral line 46 to 48.

c. Dorsal behind the ventrals; ends over the commencement of anal fin. *A. brama*, D. 11, A. 28,29; scales on lateral line 54.

d. Dorsal placed directly above the anal fin. *A. ballerus*, D. 11, A. 40,41; scales on lateral line 70.

B.—Under jaw longest.

a. Dorsal commencing behind the ventrals. *A. aspius*, D. 10, A. 17; scales on lateral line 62.

b. Dorsal partly above the anal fin. *A. alburnus*, D. 11, A. 20; scales on lateral line 50.

c. Dorsal entirely above the anal. *A. cultratus*, D. 9, A. 30.

A.—Upper jaw longest.

76. Abramis Wimba, Nilss. Wimma. F. D.

Is scarcely so broad as many others of this family, for the greatest height of the body is equal to only one-fourth of its length. In fact, as Mr. Lloyd observes, it much more resembles the young of some species of *Coregoni*, but is readily distinguished by the absence of the adipose fin. It may be easily recognized by its thick projecting snout. I do not believe that they attain any very large size, although I have seen them taken in the Wener about a foot long. They appear to be most common in those rivers that run into the Baltic, where many of them winter in brackish water; but about the end of May they ascend the rivers to spawn in clear running water. They abound in some parts of the lake Wener; they are not considered of much value for the table; appear to be very common in the Gulfs of Bothnia and Finland, and also in Ladoga; come out of the large lakes and the Baltic, where they winter, into the rivers about May to spawn. The long, projecting snout and rounder body marks the wimma. Colour brown above; sides, silvery, tinged with yellow; pectorals reddish brown; ventrals more red; anal paler.

77. Abramis Brama, Cuv. Braxen. The Bream. D. F. Young fish: Cyprinus Farenus, Art. Braxenpanka.

Is met with from the south of Scania to the far north of Norrland, and is considered here both the largest as well

as the best of the whole genus. Its general length is about a foot, but they are often taken larger, and a bream of 4 to 5 lb. is in Wermland considered about a middle-sized fish. They are particularly fond of those ponds and waters where the "quill wort" (*Isoetes Lacustris*, L.) abounds. They are considered so shy a fish, that in certain parishes which border on the Lake Wener it is forbidden to ring the bells for church during the spawning season, which usually takes place early in June.

The younger fish are so unlike the old ones, that they are by some considered a distinct species, *C. Farenus*, Art.; Braxenpanka, Sw.

The bream is met with to about the polar circle, but does not go over the Lapland frontier. On the Finland coast is met with in brackish water.

78. ABRAMIS BALLERUS, Cuv. Faren. D.

This fine-shaped bream may be distinguished at a glance from any other of the family by its long cloven tail, its smaller scales, and its long anal fin; jaws equal; 16 scales in a row between the lateral line and dorsal.

Is certainly the rarest of all the breams in Sweden, but is found in the Wener, and in fact in many of the midland lakes, but nowhere so common as in the "Mälar." Nilsson gives the size of the specimen he describes as 1 ft. 2 in.; I never saw one so large. They spawn in the end of April or May, and Nilsson mentions a curious mark of distinction between the sexes at this time. The male has under the lateral line, over the hinder part of the anal fin, a yellowish patch rough to the finger, on which the scales are covered with a slimy skin full of small warts; and these warts are also even apparent on the pectorals. This disappears after the spawning season. I have remarked this myself, in a specimen taken in the Lake Fryken; and curiously enough I have remarked that the male roach in the spawning season are covered with sharp tubercles all over the body, especially on the head.

Little appears to be known of the habits of this fish, but most probably they much resemble those of the other breams.

The Pomeranian bream, *A. Buggenhagii*, Bl., is not included by Nilsson in the Scandinavian fishes; but Mr. Lloyd says, "We had another bream, called by the Wener fishermen 'Sjö Ruda,' or Lake Carp, but of what species I cannot exactly make out. Mr. Yarrell, to whom I submitted several specimens brought from the Wener, is inclined to think it the *A. Buggenhagii*, Bl."

This Pomeranian bream rather resembles the wimma, and might even be taken for a young of the *brama* or *ballerus*, if the smaller number of rays in the anal fin (18 to 19), did not prove it to be a distinct species. According to Valenciennes, it most resembles *A. Björkna*; scales on the lateral line, 48.

79. Abramis Blicca, Cuv.; Cyprinus Björkna, Art. Björkna. The White Bream, or Breamflat. F. D.

Not so deep as the common bream. May always be known by its shiny silvery appearance. Is very common in many of the Scandinavian waters, as far north as Upland. The young fish resemble the roach, the older ones the young bream. It is, therefore, not an easy fish to identify, except by a careful examination of fin rays and scales on the lateral line. They spawn here in June. The habits are the same as those of the rest of the family. Usual length, 10 to 11 in.; height, 4 in.

Is tolerably common in Ladoga, in Finland.

B.—Under jaw longest.

Aspius, Agass.

80. Abramis Aspius, Nilss.; Aspius Rapax, Agass. Asp. D. F.

This is another of the genus which in shape much resembles the gwynniad, but it may be easily known by the very projecting under jaw and the larger mouth; eyes

small, one-eighth of the length of the head. Colour blueish grey, sides silvery, iris yellow; dorsal grey with a red tinge; caudal the same; anal and pectorals reddish.

Is one of the largest of the whole family, according to Nilsson occasionally attaining a length of 3 ft. In fact, one of the specimens described by him was 2 ft. 7¼ in. It is principally confined to the lakes and rivers in the east of the middle of Sweden; and is met with in the lakes Mälar, Hjelmaren, Wener, and Wetter. It is perhaps the only species of this family that is a fish of prey, and it greedily devours the "nors," or small smelts that abound in the above-named lakes. Those which I saw in a sort of moat or canal in Orebro seemed as tame as carp, and readily took bread which was cast in to them.

The flesh is excellent, but they say hard of digestion. This is another fish which I think might advantageously be introduced into the British waters; for although a fish of prey, worms, insects, and larva form the greater portion of its food, and I think many British waters would suit it. They spawn with us in the end of April, or early in May. This fish is called in the Wener the "stam," as is also the *leuciscus grislagine*.

81. ABRAMIS ALBURNUS, Nilss.; Cyprinus Alburnus, Lin.
Löja. The Bleak. D. F.

Is common in all the northern waters, from the far south of the country, at least as far north as Lake Kalix, in Lulea Lapland. I have taken them here nearly 7 in. long. They spawn in the beginning of June.

Gen. *Chela*, Buchan.

Form like the bleak, with a turned up nose; lateral line winds all over the sides.

82. CHELA CULTRATUS, Buchan. CYPRINUS CULTRATUS, L.
Skär Braxen. D.

Scales thin and small, about 110 on the lateral line; body much compressed, the under part of the belly in

front of the anal fin forming a sharp edge; nose very blunt and turned up.

This fish, whose native home is North Germany, Prussia, etc., where it is said to attain a length of 18 in., must be considered as one of the rarest of Scandinavian fish, only one specimen having been taken in this country, and this was procured by Linnæus himself, in Christianstad, in the south of Sweden. Is met with in the Lake Ladoga. More properly belongs to the Black and Caspian Seas.

Gen. *Cobitis*, L.

Dorsal and anal short; mouth under the nose bearded; body elongated, round, covered with slime and small scales; tail fin square; gill openings small.

83. COBITIS BARBATULA, L. Grönling. The Loach. F. D.

Is certainly a very rare fish in Sweden, if it is ever found here, of which there appears to be a doubt. I never saw a Swedish specimen. Sides of the head unarmed. Common in Finland up to 65°.

84. COBITIS TÆNIA, L. Nissöga. The Spined Loach. F. D.

Beneath each eye is a forked spine.

Is met with, according to Nilsson, in many places in the middle of Sweden, and I have seen several specimens taken in the Wenor. Is certainly more plentiful in Scandinavia than the last.

Fam. 2.—ESOCIDÆ.

One dorsal fin, set far back; head flat, with wide gape; body long; both covered with hard scales; teeth formidable.

Gen. *Esox*, L.

Inter-maxillaries forming two-thirds of the upper jaw; fresh waters; live singly.

85. ESOX LUCIUS, L. Gädda. The Pike. F. D.

Is the commonest of all the Scandinavian fresh water fish,

and is met with everywhere, from the south of Scania to far up in Lapland and Finland, and even in fell lakes above the birch region. The pike spawns in Sweden at three different seasons: the younger and smaller fish begin first, about the end of February; these are called "is gaddor," or ice pike, and are about 18 in. long. A little later, in March and April, the larger ones spawn; these are called "frö gäddor," or frog pike, because the common frogs spawn about the same time. The largest spawn in May, when the trees are in leaf and are consequently called "löf gäddor" or leaf pike.

It is a singular circumstance here, and one which I never noticed in England, that at certain times the gums grow over the teeth of the pike, like the lampas in a young horse, and for ten days or so they cannot take a bait well. These periods are said by some to occur regularly, according to the age of the moon; but what appears singular is that they are not supposed to occur at the same time every year, but to be dependent on the termination of the spawning season. I never yet met with any one, however, who could fully explain this phenomenon, or state exactly at what time of the moon it would occur. But I have noticed it at certain times during the whole fishing season, and they say, that ten days before the new moon and ten days after is the period when the pike cannot hang on a bait.

Gen. *Scomber Esoces*, Müll.

The lower throat bones grown up together, as in the *labri*. Salt water fish. Go in large shoals. Dorsal and anal fins entire.

Subgen. *Belone*, Cuv.

Body like an eel; nose lengthened to a long small round beak; dorsal and anal fins entire.

86. BELONE VULGARIS, Cuv. Näbbgädda. The Gar Fish. F. D.

Is very common both in the North Sea, Cattegat, and

South of the Baltic; even on the Stockholm and Finland coast in May, when they come into the shallow water to spawn. Like the pike, they spawn at three different times, and the season lasts from the beginning of May to the end of June, when they go back again to the deeps. They have an old saying in the south of Sweden, that when many gar fish come on to the coast in May, a dry summer and a dear year will follow. Their general length here is 2 ft. to 2 ft. 6 in. The little fish described in Yarrell as the "European hemiramphus," has been several times taken in the Baltic, but I believe it is the opinion of Swedish naturalists in general, that it is nothing more than the young of the gar fish. Nilsson does not give an opinion one way or the other. He does not, however, include it in the Scandinavian fishes as a distinct species, and I fancy repudiates it.

Subgen. *Scomber Esox*, Lacep.

Like the gar fish, but the dorsal and anal fins are divided into small finlets, as in the mackerel. Length 1 ft. to 1½ ft.

87. Scomber Esox Camperi, Lacep. Makrill Gädda. The Saury Pike. D.

Has only once, before 1863, been taken in the Sound and once off Christiania, in Norway. An example, however, was in 1863 taken off the Swedish coast, near Malmo, so there is no doubt now that it is entitled to a place in the Swedish fauna.

Fam. 3.—Siluridæ.

One single dorsal, in front of the back; body long, without scales; long feelers or barbs around the mouth. Fresh water fish, living on the bottom.

Gen. *Silurus*, L.

One short dorsal; no adipose fin; a long anal.

88. Silurus Glarnis, L. Mal. The Sly Silurus. F. D.

Six barbules, two very long, four shorter. Rather

resembles the burbot in habits, appearance and color. Colour above blackish green, with dark spots; below whitish. Is perhaps the largest fresh water fish in Europe; has been known to attain a length of 6 to 8 ft., and a weight of 150 lb. Is found in some lakes and large rivers, in the eastern division of Sweden, especially in Småland and Kalmar Land, specimens having been taken there 4 ft. long and weighing 80 lb.; and it is on record that one was caught in the Mälar lake, in May 1846, which was 7 ft. 6 in. long and weighed 136 lb. They are said to spawn at midsummer, but little is known of this, or indeed of their other habits.

It is very doubtful whether the silurus can be classed among the British fishes, although I believe within the last few years attempts have been made to introduce them into the British waters, where, however, in my opinion, they would never attain to any great size. The silurus is a sluggish, voracious fish, lying on the bottom, moving its long feelers to and fro, no doubt for the purpose of attracting its prey within reach. In Finland is met with only in the lakes around Tavastohus.

Fam. 4.—Salmonidæ.

Every member of this family can be at once distinguished by the small fatty adipose or hinder dorsal fin, near the root of the tail, over the root of the last anal fin ray. They are all more or less fish of prey; some live entirely in fresh water, others only in the sea, but most of them pass the greater portion of the year in fresh waters, where they spawn, and return to the sea for a short time to recruit themselves afterwards. Very clean, neatly formed fish. The salmon have no true type in the South American or Australian seas, where they are represented by the *Galaxidæ*.

Salmo, Art. Salmon and Trout.

Adipose fin, placed over the hinder part of the anal fin.

Artedi divides this genus thus:—

1. *Trutta*, or *Salmo proprii*. Spots darker than the colour of the body; scales tolerably small, about 10 to 12 in a row of a quarter the length of the head; along the vomer are either a row of teeth or a raised keel, which is not, however, visible till the skin is taken away. Spawn in running water.

2. *Salvelini*, Charr. Spots red or whitish, generally paler than the body colour; scales very small, about 18 to 20 in a row, a quarter the length of the head; vomer, which has teeth only on the front, is for the rest smooth without teeth or keel. Spawn in still water.

No family is so difficult to divide into species as this. No great stress can be laid upon the different shape of the gill covers, or position of the teeth on the vomer, for these may differ even among individuals of the same genus, and the colour and even the form of the fish, depends upon different waters and localities. I have not space here to enter fully into this subject, nor have I the ability to do so, I can only, therefore, notice the different species peculiar to Scandinavia, and make a few remarks on them and their probable identity with other known species, from my own personal investigation, and from the observation of men far better acquainted with the subject than myself.

Of the first division, the Salmon proper (Salmon and Trout), we certainly have in the Scandinavian waters six distinct *forms*, if not distinct species, viz:—

MIGRATORY.

1. *S. Salar*, L. The Sea Salmon
2. *S. Eriox*, L. The Bull Trout.
3. *S. Trutta*, L. The Salmon Trout.

NON-MIGRANTS.

4. *S. salar*, var. *Lacustris*. Wenerns Silfver Lax.

5. *S. microps*, Hard.; *S. ferox*, Jard. Great Lake Trout.
6. *S. fario*, L. Common Trout.

And of the second division, or charr, we have two clearly distinct forms if not species.

1. *S. alpinus*, L. The Charr. Lapplands Röding, Sw.
2. *S. salvelinus*, Bl. Wetterns Röding, Sw.

89. SALMO SALAR, L. Blank Lax. The Salmon. D. F.

Whatever difficulty there may be in identifying any other members of the family, or distinguishing one from the other, there is no doubt that the sea salmon of Scandinavia is precisely the same as the salmon of Great Britain and North America, and its habits in these waters are the same as in other countries. They are common all round these coasts, and ascend the rivers which run into the Baltic, Bothnia, Cattegat, North, and Polar Seas, in the end of the spring, to spawn. But in many streams they cannot come up far, on account of the steep water falls with which these northern rivers abound, and as salmon ladders or other devices to assist the fish in their progress to and from the sea are not in use here, the falls generally prove insurmountable obstacles. On this account we have no fresh run sea salmon in the Wener, for they could not come up the falls of Trolhattan, which lie about six English miles down the Gotha, south of this lake. The sea salmon, as well as the bull trout and salmon trout, however, come up to the bottom of the falls to spawn every spring, and the different seasons of their appearance at the little village of Lilla Edet, about twenty miles below the falls, as stated by Nilsson, may be relied upon as correct. The sea salmon generally begin their spring migrations here as soon as the rivers are free from ice, and these migrations appear to go on periodically during nearly the whole summer, and the fish are called according to the season when they arrive. Thus at Lilla Edet, the first that come up are:

1. Mört Lax. These are smaller than the general salmon and come up the river in the end of April, or early in May, when the "mört," or roach, spawn.

2. Hägg Lax, which come up in May, when the "hägg," or bird cherry, blossoms, and these are the largest of all, sometimes weighing 50 lb., rarely 55 lb.

3. Börting, or saxörling, do not begin to ascend the streams to Lilla Edet, Falkenberg (in the south), etc., till after the 20th May, when the migration of the large salmon is over; and the migration of these "börting" continues more or less until October. The "börting" are smaller than the common salmon, and have thinner scales, which easily peel off.

After the spawning season is over, the salmon return to the sea, where they remain all the winter spread about, and apparently making long migrations. In one of the rivers of Norrland, a salmon was taken in the spring in which was found a certain kind of hook, which at that time was only used on the coasts of Pomerania.

Some naturalists have supposed that the crook in the under jaw of the male salmon during the spawning season has been provided by nature to moderate the effects of the severe battles which take place at this time between the male fish, certainly not to assist them in the operation of spawning. The largest salmon noticed by Nilsson was a male taken in the sea off the coast of Calmar, in November, it was 4 ft. 2¼ in. long, and 11¼ in. high.

The general spawning season of the sea salmon here appears to be throughout the month of November.

90. Salmo Eriox, L. Grå Lax. The Bull Trout. D.

Does not appear to be so common on any of the Scandinavian coasts as the salmon. According to Malmgren (who has lately published a list of the fish found in Finland, and which contains some interesting remarks on the great lake trouts of Scandinavia to which I shall hereafter refer) this bull trout is nothing more than a form of the *S. trutta*, L., or salmon trout, which latter fish, however, he allows to be a good and distinct species. In his description of *S. trutta*, L., he gives as synonymes: *S. trutta*, L.; *S. eriox*, *S. ocla*, and *S. trutta*, Nilss.; the salmon trout, Yarr.;

S. truttula, Nilss., sterile form. Sw. hafs forell, grå lax, Börting. Fin. taimar.

"Professor Nilsson," he remarks "has made of this fish not less than three distinct species, viz.:

"*S. trutta*, L.—The young full grown fish in winter and spring during its residence in the sea.

"*S. ocla*.—The same fish ready to spawn in rivers, and most probably the female fish directly after spawning.

"*S. eriox*.—(Grey or bull trout, Yarr). A very old fish, which has lost its teeth on the hinder part of the vomer."

Professor Nilsson's statement that the ocla is met with in the large Scandinavian lakes, has arisen from a confusion with the *trutta lacustris*, Sieb. (*S. salar*, var. *lacustris* Hard., a description of which will be found below). In Finland they take this *S. trutta*, L. mostly in the northern Osterhottens rivers, where they are called taimen, but they are also found in the Gulf of Finland and the Polar Sea. It is undeniable that the *S. spurius*, Pall., belongs to this species.

"According also to Widigren the "börting" or *S. trutta*, and the *S. eriox* are the same fish at different ages, for he says there are no specific characters which can distinguish the *S. eriox* from very old individuals of the *S. trutta*.

"*S. truttula*, Nilss., Prod., of which through the kindness of Dr. Widigren, I have received specimens from Ide Fjord, in Bohus Land, is without doubt a sterile form of the *S. trutta*, as is the *S. Schiefferm*ü*lleri*, Bloch. (Wetterns silfver lax), only a sterile form of the *trutta lacustris*, Sieb." This I doubt.

The investigation of this subject of sterility in the genus *salmo* is interesting. That there may be sterile forms of both the Wetterns and Wenerns silfver lax which I believe are precisely the same fish, I do not deny, but they are certainly very rare in the Wener, where we have two clearly distinct species of lake trout, which never by any chance appear to breed together, and both of which are taken in our lake in the autumn, full of roe and milt.

The bull trout attains a great size in these waters, and is precisely the same as the British fish. I cannot, at least at present, agree with Malmgren, but consider the bull trout as good and defined a species as the salmon trout. However, much remains to be cleared up as regards this genus, and in the present state of our investigation most of our opinions are grounded only on suppositions.

91. Salmo Trutta, L. Laxöring Tajmen. The Salmon Trout. D. F.

The Scandinavian form is clearly identical with the British fish, as well as with the examples sent from Finland, and seems to agree exactly with Agassiz's figure and description of *S. trutta*, var. tab. 8, Nilsson.

Is met with in all the Scandinavian coasts, from the extreme south of Sweden to far up into Lapland and Norrland. Nilsson remarks that the salmon trout in the spawning season has a crook in the under jaw, but not so large as the salmon, and also red spots mixed with the darker ones. Nilsson mentions specimens taken in Karlaby River of the weight of 16 lb.

They spawn here in the middle of October.

Fresh Water Salmon or Trout.

92. Salmo microps, Hardin. S. Ferox, Jard. The Great Lake Trout. Insjö Forell, Vår Lax, Wenerns Lax.

I shall, I trust, be excused if my remarks on the two species of large fresh water trout, peculiar to Scandinavia, are rather long, for much confusion has existed, and still does exist, as to their identity. Both species or forms are met with in the Wener in great numbers. In the southern part of the lake the *S. ferox*, or Wenerns lax, certainly attains a larger size than in the north; whereas in the south of the lake the "silfver lax" (*S. salar*, var. *Lacustris*, Hard.) is much scarcer, and always smaller than in the Carlstad waters at the north of the lake, where it often is taken up to the weight of 20 to 22 lb., whereas in the

waters around Wenersborg, on the south of the lake (according to Mr. Lloyd, who has, perhaps, had as much experience in salmon fishing in the Wener as any man living) their usual weight is 7 to 9 lb., and the largest he ever heard of was one of 14 lb., which he killed himself.

That this *S. microps*, Hard., is identical with the British lake trout (*T. Ferox*, Jard.) is, I believe, universally allowed, and I shall only give a short description of our Wener fish (furnished to me by Magister Hardin, Carlstad), that the reader may compare it with his description of the "silfver lax," hereafter described. He says:—"This species," speaking of his *S. microps* (the *S. ferox*, Jard.), which is decidedly distinct from the "silfver lax," "has small eyes, on which account I have given it the name of *S. microps*. In this fish the upper maxillary bone reaches more or less behind the eye. The scales are rounded, covered with a thick black spotted slimy skin, only in the middle marked with a round silvery spot, and swelled up at the edges, on which account the rows are less distinct, and the colour not so silvery as in the 'silfver lax.' The spots are placed close together, above as well as below the lateral line, also on the gill covers; tail, even at the end, or nearly so."

"This species is called by the Carlstad fishermen 'vår lax,' or spring salmon; because it is the first that begins to ascend the Klar River (north of the Wener), in the spring, although in smaller numbers than the 'silfver lax.' It is properly called the Wenerns lax, because it is found over the whole lake, and is the one which is taken all round its shores by different devices, such as spinning, etc. This fish, moreover, goes up most of the tributary streams which run into the Wener (as the Bije Elfven up to Jösseforss), whereas, on the contrary, the "silfver lax" only goes up the Klar River, and is principally taken in that neighbourhood. That this 'vår lax' is Yarrell's *S. ferox* I think is certain, because Sir Thomas Wilson furnished Yarrell with specimens from the Wener, and his figure agrees with our 'vår lax.'

"That these two Wener fish are entirely distinct species

I infer from the fact, that they both ascend the river at the same time, and yet we never see the slightest signs of a transition form from one to the other, but we can always with the greatest ease, distinguish them; and, moreover, both retain their characters as distinct species even during the spawning season."

Lloyd, who gives an excellent engraving of this fish in his "Scandinavian Adventures," from a male weighing upwards of 30 lb., and measuring 42 in. in length, says:— "Many of these fish remain in the river Gotha all the year round, but by far the greater portion, when the spring was pretty well advanced, left us for the Wener, where they passed the summer, and it was not until the fall of the year that they again revisited our rapids for the purpose of spawning. They spawn in the end of October or November, but long prior to this period, generally in the month of August, they fell down from the lake into the upper part of the river. The first batch consisted mostly of males, and it was not until some little time afterwards that any considerable number of the females joined company. When the spawning was over, the fish either headed back into the Wener or retired to the deep pools in the Gotha, where they remained during the winter to recruit their strength. The males, on an average, are nearly a third larger than the females. I have not unfrequently captured males of 30 lb. and upwards, whereas the females seldom exceed 20 lb."

Description of a fresh-caught Wenerns lax (*S. ferox*), which I saw at Mr. Lloyd's house, in Wenersborg, July 5th, 1863. It was a male fish of 30 lb., caught by spinning. Its length was 3 ft.; depth under the first dorsal fin 8 in.; tail 7 in. across, nearly even at the edge; upper maxillary extended 1¼ inch beyond the back of the eye when the mouth was closed. The spots were round, not cruciform, as in the "silfver lax;" the shape of the scales different; eye about 1 in. across both ways; not a red spot on this fish.

On remarking the great resemblance between this fish and the *S. eriox*, L., or bull trout, Lloyd hazards an opinion whether it may not be identical with that fish, though

slightly altered by a long permanent residence in the fresh water, to which it has been restricted.

There is much in this remark, and I think very probably that such may be the case. That Malmgren's opinion coincides with it, is certain, for after describing the *S. trutta*, L., as a distinct species, he gives us Var. B.—*Trutta lacustris*, Sieb; *S. ferox*, Jard.; *S. trutta*, Agass.; *S. ferox*, Nilss.; *S. microps*, Hard.; *S. trutta*, Widigren (sterile form); *S. Schiefferm*ü*lleri*, Bl.; *S. lacustris*, Agass.; *S. lacustris*, Heck. and Kor. (sterile form, according to Widigren); Insjo forell, Sw. And he remarks:—"As the *trutta relicta* (vide next description) is in the Lake Ladoga a confined form of the sea salmon (*S. salar*, L.), so is it fair to suppose that this fish is a confined form in our inland lakes, of the sea trout (*S. trutta*, L.)

"Most icthyologists consider this a distinct species, although we have not had the luck as yet to prove it so by any certain distinguishing marks. According to my judgment, it is as impossible to consider this and the following variety" (he here alludes to the common trout, *S. fario*, L.) "as true and well defined species, as it is wrong to follow Dr. Widigren, and reduce them altogether to one single species, without noticing or accounting for the different forms in which this species is met with in nature. The distinguishing marks of this variety are its stronger teeth and darker body colour, especially above. They live in most of our large Finnish inland lakes, such as Ladoga, etc., out of which they ascend the rivers to spawn.

"Siebold, who considers both this and the *S. fario*, L., as good species, gives as one of the specific differences in this fish that it has larger scales than the sea trout (*S. trutta*, L.); but we can lay little stress on this, because the scales vary so much in size even in members of the same form. The stronger teeth in the 'insjo forell' are accounted for by the fact that this fish principally lives on smaller fish, whereas the salmon trout (hafs forell) lives on smaller animals, principally *crustacea*, for the seizing of which strong teeth are not required. Between our speci-

mens of the Finland 'insjo forell' and those which inhabit the lakes of Sweden, Switzerland, and England, under the various synonymes given above, I cannot see the slightest difference."

It was in the lake trout in Bodensjön that Siebold first detected sterility, which among the genus *salmo* does not appear to be so very uncommon. Dr. Widigren has since conceived that the Wettern's so-called "silfver lax" is no other than a similar sterile form of the "insjo forell" (*S. ferox*, Jard.), and in every respect agrees with the "insjo forell" of Boden Ijö, which has always hitherto been considered a good and distinct species, and called *S. lacustris*, Agass. The sterile form of "insjö forell" may be known by the smarter shape of its body, by the indented tail fin, by the paler body colour (the young are steel blue), a lesser number of spots on the body, and, for the rest, by a general appearance which strongly reminds us of the sea salmon, from which it only differs by the row of strong teeth along the whole vomer.

The flesh of our Wenerns lax is neither so rich or so red coloured as that of the sea salmon. They take a bait freely; but I never knew one rise to the fly, although they may do so.

93. SALMO SALAR, Var. Lacustris, Hard. "Silfver Lax."

This second species or form of Scandinavian lake trout or salmon (for it is clearly a salmon, and not a trout, like the last), was very common in the Wener, especially in the River Klar, where we call it the Degeforss lax, on account of their being captured in immense numbers in the salmon trap at the falls of that place, a few miles up the river.

It is a more salmon-shaped fish than the last, and is of a bright silvery colour, whence its name. It is a splendid fish, both for sport and the table; will rise as readily at the fly as a bait; and although not quite so red, the flesh is very little inferior to that of the sea salmon. In fact, in appearance it precisely resembles the salmon trout; and in form, colour, or general appearance, I could never detect any difference between the sea salmon trout, this silfver lax of

the Wener, and the large trout which we used to catch in the Tarra river, up in Quickiock, Lapland, called there the "börting," especially when fresh killed. Now, these "börting," or "börsting," are considered by Widigren to be the *S. ferox;* and he, moreover, adds that he can see no difference between *S. eriox* and old examples of *S. trutta.* Be these Lapland fish, however, what they may, it is certain that they must be confined all their lives to these Quickiock waters, for they never can ascend and descend the falls in the Lulea River, to get to and from the sea. I had only one season's experience in the Quickiock waters, and I certainly considered these "börting" as identical with our Wenerns silfver lax; I only saw one or two, which I fancied more resembled our vår lax taken there, and they were small, and might have been even large *S. fario.* But I fancy they had both forms of these fish in the Quickiock waters.

There are even now doubts whether this fish is identical with any other European salmon or trout. Dr. Günther, to whom I sent specimens both of this and *S. microps,* considered them distinct species; and he further observed that our *S. salar* (lax) agrees with the "silber lachs" of Lake Constance, in the shape and length of the pectorals; but the whole form of the head and body of the latter are so peculiarly elongate, that I cannot hesitate to consider them as distinct.

Hardin has well described the peculiarities of this fish in the following diagnosis:—"Eyes large; upper maxillary bone scarcely reaches to the hinder edge of the eye; scales lying in regular transverse rows; their outer division is altogether silvered over, and their shape nearly rhomboidical; spots few, generally cruciform, almost invariably placed above the lateral line and on the gill cover; tail semi-lunate or cloven, with pointed lobes." "This species," he adds, "so much resembles the sea salmon, that we can easily suppose it to be a form of that fish, which, on account of its long confinement in salt water, never attains the size of those that inhabit the sea."

And this is Malmgren's opinion; for, when speaking of the Finland salmon, he says:—

"In Ladoga we meet with a form of sea salmon which Dr. Widigren declared to be identical with those that inhabit the Wener, in Sweden. I am myself convinced that this Ladoga salmon is not a distinct species, but a confined form of the sea salmon, its character changed by thousands of years' residence in fresh water. I propose, therefore, that this Ladoga salmon shall be considered as a variety of the *salmo salar* (*trutta salar*, Sieb.), under the name of *trutta relicta*.

"The *T. relicta* which we take in Finland differs at the first glance from the common *trutta salar*, Sieb. (*S. salar*, L.), on account of the smaller size and the different distribution of the black spots on the body. *Trutta salar* has in general few spots, and these mostly placed above the lateral line, whereas in the *trutta relicta* the spots on the front part of the body extend below the lateral line, and are spread pretty thickly in front of the pectorals behind the gill covers. *Trutta relicta* seldom reaches a weight of more than 20 lb.; its general size appears to be 10 to 12 lb. They shed the teeth on the vomer much sooner than the sea salmon. In all which I have examined, even among the smaller ones which only weighed 4 to 6 lb., I could detect no sign of a row of teeth remaining on the back part of the vomer, whereas in the *S. salar* I have often found them remaining in a specimen of 8 lb. In the *T. relicta* three or four teeth always sit in a cross row in front of the vomer. The male of the sea salmon has always in the spawning season a large crook on the under jaw, but in the male of *trutta relicta* this is small, often nearly imperceptible.

"The roe cones in *trutta relicta* are much smaller than those of the sea salmon, and appear to hatch some weeks earlier."

There seems a mystery as to the spawning habits of the Wenerns silfver lax. Mr. Lloyd remarks: "What became of them in the spawning season was always a mystery to us,

but the presumption is that it either held its 'lek' in the deeps, or, which is less probable, that it crossed the Wener, and ascended some of its tributaries. It was always in the highest possible condition, even in the early part of the spring, at which time the adult *S. microps* had only partially recovered from the effects of spawning."

Hardin also remarks: "It is commonly supposed that salmon ascend rivers and their falls for the sake of spawning, but this is certainly not the case with our Wener salmon. In the beginning of November I have received these fish of both sexes, which have been taken 'under lek' (in the act of spawning) right out in the lake; but I could never find the least proof that they deposited their roe up the river. Their annual migrations up the Klar (which are at their height about Midsummer, when some thousands are taken at Carlstad) must be for some other purpose than that of spawning."

The "Wetterns lax," which I have received from Dr. Widigren, is very like the Wener's fish, which I call the *S. microps*, and certainly belongs, like that fish, to the division *Trutta*, yet, nevertheless, appears to me to be a distinct form.

The shape of the scales is one of the best distinguishing marks between the divisions of this family. In the salmon the scales are round, and rather broader than they are long; but in the trout, on the contrary, they are more oblong, and more horizontally placed.

Respecting the sterility in some of this genus, Malmgren makes the following interesting remark:—"Like all the rest of the genus in the breeding season, this species is covered with a thick dark slime, and this is supposed by Widigren to serve as nourishment to the fish during this season. This is assumed by the fish before the spawning season begins, and is retained a long time after it. The fish is then called in Lake Ladoga 'harmaga lohi.' I could not make out whether the fishermen here mean by the name of 'walkea lohi' anything more than such individuals as have not assumed this dark spawning dress; but an old

fisherman told me that this walkea lohi *never spawned*. It would be of the greatest interest if we could prove whether this walkea lohi is permanently barren, or whether, as some think, it only spawns every other year. They ground this idea upon the fact that the sea salmon does not spawn every year."

94. SALMO FARIO; L. Forell. The Common Trout. D.

Of this fish we have two distinct forms in Scandinavia.

1. The *S. fario*, Cuv.; Bäck Forell.
2. *S. punctatus*, Cuv.; Fjäll Forell.

The former is clearly identical with the common trout of Britain and the Continent; is dispersed over the whole of Scandinavia; and Nilsson mentions that on the Dovre Fell, in Norway, he has seen them 18 in. long, and they occasionally reach the weight of 12 lb. and upwards. In the south of Sweden, however, they rarely exceed 6 to 8 in. in length.

S. punctatus may always be distinguished by the little dark spots with which the body is thickly strewed all over. Is confined to the fell lakes, and can live at a greater elevation than any other European fish, for we never find the charr in those lakes that lie above the willow region, whereas the fjäll trout thrives in waters which are surrounded by perpetual snows.

Malmgren makes the *S. fario*, or common trout, nothing more than a variety (Var. C.) of the *S. trutta*, L., or salmon trout. I do not fancy many naturalists will agree to this, although, doubtless, there is much truth in what he says respecting this fish:—"Large individuals of this variety can be known by no certain distinguishing characters from individuals of the same size of the foregoing variety (*S. ferox*)."

It can be no other than a large example of *fario* which Nilsson has described as *S. ferox*, Jard., in his "Scandinavian Fishes," p. 415, and which was sent down from the Tornea river; and even Nordmann has fancied that a full-grown *S. fario*, caught in the Kajana river, was *S. ferox*.

These facts are quoted only to prove how difficult it is to distinguish this and *S. ferox* from each other. In the trout state, as Widigren properly observes, it is impossible to distinguish *S. trutta* and *S. ferox* from examples of *S. fario* of the same size; and it is often almost impossible to distinguish individuals of the different forms of the same size from each other, unless we know from what waters they were taken. How, then, can we consider them as distinct species? Even in the common trout (*S. fario*, L.), Siebold has detected many barren individuals. Without doubt such may also be found in the north.

It will be seen by the above description that in Scandinavia we have, as I consider, at present three species of migratory salmon, and three species confined to the fresh waters; for I can hardly agree with Malmgren, and consider the *S. eriox*, or bull trout, and the *S. fario*, L., common trout, as nothing more than varieties of the *S. trutta*, L., or salmon trout. I think there is much in his remarks respecting the identity of our large lake trouts with the sea salmon and the bull trout, and very probably these two fish are not distinct species, but only degenerated forms of the sea fish, changed by a long residence in fresh water. However, in the present state of uncertainty (for after all it is only a supposition that these two large lake trout are nothing more than forms of the salt water species), I have deemed it best to consider our two lake trout or salmon as distinct species, and I think we may fairly erase from the list Nilsson's *S. ocla* and *S. truttula*.

A careful study of sterility in members of this family will probably lead to important results, and may account for many a curious form of salmon or trout which has hitherto puzzled our icthyologists.

Respecting the propagation of hybrids between the different species of this genus, such as between the sea salmon and common trout, I consider it a subject to be approached with great caution. Without at all denying that a hybrid fish can be produced as well as a hybrid bird, it seems so contrary to all natural laws that I can never believe, except

in the most extreme cases, that two species of the same genus will ever breed together in a state of nature. If fish were in the habit of doing so, there would be no end to the curious varieties that we should meet with in every water. We might see crosses between the perch and the ruffe, between the roach and the bream, the chub and the dace, between the common trout and the charr, and more especially between the two forms of our Wener lake trout. Yet I never saw a net drawn in Sweden without being able at a glance to name every fish that came to land; and Hardin's remark as to the lake trout in the Wener (and he has had opportunities of examining thousands of these fish fresh caught in the Klar river), that "we never see any transition from one to the other, but can easily distinguish the two forms, even by the short diagnosis which he has given," is a pretty good proof that hybrids between these two forms or species (call them which we will) do not exist.

Salvelini, Nilss. Rödingar. Charr.

95. S. ALPINUS, L. Lapland's Röding. The Charr. F.

Is common in all the northern fell waters, more especially in Lapland, and appears to be identical with *S. Alpinus* of Scotland, although the Scotch charr arrive at maturity at a size inferior to the Swedish charr. The usual size of those we take in the Wermland lakes is under a foot, but I have seen them considerably larger, and weighing 5 lb. They appear to be as general feeders as the salmon and trout, for here they will rise at the fly, and they will also greedily take dew worms, grubs, and even small pieces of fat pork. We principally take them in our fell lakes on night lines baited with dew worms, or in fine trammels, and we also catch a good many in the winter in holes cut through the ice. I believe the southern limit of the charr in Sweden is a small fell lake in Dalsland (about 58°), at no very great elevation above the sea, but, of course, the further north we travel the more plentiful, as well as heavier, are these fish. The habits of the charr are curious, and there seems even still to be much mystery attached to them. They appear to

become more migratory the further north we travel. In Wermland they never leave the deep fell lakes to spawn, but come up for that purpose on to the shallow water at the sides and in the middle of Sweden. I never heard of any being taken in rivers. Up in Lapland and north Norway we read of them being frequently caught with the fly in the large rivers under the falls. And now another most singular fact has been noticed regarding the migratory habits of this fish, both by Professor Liljeborg, in Finland, in 1848, and later still, by an English salmon fisher, which is, that in the tracts round the North Cape they leave the rivers for the sea, like the sea salmon after spawning, as they have been taken on their return in the mouth of the rivers with sea lice on their bodies.

96. S. SALVELINUS, Bl. Wetterns Röding.

It is hardly yet, I believe, decided whether this large charr, which appears in Sweden to be almost peculiar to the lake Wetter, and is never found in the adjacent lake Wener, is a distinct species, or only a larger form of the common charr. Dr, Günther certainly considers it a distinct species, and identical with the *S. salvelinus* of the Continent. Malmgren, on the contrary, considers them one and the same fish, and in remarking on the Ladoga charr, he says—"Of this fish we find in the deeper waters a large and a small form, generally so dissimilar in colour that the fishermen consider them as distinct species, and give them different names. In Ladoga they call the smaller form, which live in the deepest water, 'pehuli,' and the larger form 'nieria.' Pehuli lives and is taken only in the very depths of the lake, in fifty to a hundred fathoms of water, while, on the contrary, 'nieria' wanders about in shallow water, and is a greedy fish of prey. It is certain they cannot be called two distinct species, and we can only suppose the pehuli to be the young nieria, but we are in the dark as to what should cause the difference in their colour and habits. I fancy that the younger fish, which principally lives on crustacea, holds itself in the deeps where these crustacea abound. Whilst

I was dredging in Ladoga, in 1862, I found *Gammarus loricatus* and *cancelloides* living in great numbers in forty and a hundred fathoms of water, but not in shallow water, and it is just these crustacea that pehuli live on. The large nieria, on the contrary, destroys small fish, which live in shallower water."

I can, in most respects, confirm Malmgren's statements, from studying the habits of the charr in our Wermland lakes. I have seen the common charr of 4 or 5 lb. taken in Wermland frequently, and the largest I ever saw we took in a Lap lake at Quickiock. This was a male fish, in splendid condition, 2 ft. 2 in. long, weight 6¾ lb., caught on June 20th; but I have heard of charr weighing 9 lb., taken from our Wermland lakes, and this on reliable authority.

In his list of European charrs, Dr. Günther, in his diagnosis of *S. salvelinus*, says (A), "The length of the pectoral fin in the mature fish less than one half of the distance between the roots of the pectoral and ventral fins;" lateral line 190; lower parts red.

Of the *S. Alpinus* he says (B), "The length of the pectoral fin in the mature fish more than or equal to one half of the distance between the roots of the pectoral and anal fins;" lateral line 195—200. And in his description of *S. salvelinus*, L., Nilss., he notices a large male specimen from our Lake Wetter. He further remarks, "The length of the head in *S. salvelinus* exceeds the height of the body; the eye is smaller than in *S. Alpinus*, and although the number of scales in both fish is the same in specimens of a corresponding age and size, the pectorals in *salvelinus* are much longer, the maxillary is less developed," etc.

Opinions are much divided as to whether this *S. salvelinus* is a distinct species, or only a form of the common charr. All I can say is that I have examined specimens of both these fish together, and when they are of the same size I have been unable to detect much difference. Malmgren decidedly says that they are the same fish, and Nilsson only gives it as a form, not a variety, although at present I think it safest to retain it as a distinct species. Nilsson's diag-

nosis of this *S. salvelinus*, or "Wetterns röding," is: "nose more pointed; head longer; fins longer, and colour not so dark as in the common charr." This form or variety is, I believe, only found in two Swedish lakes, the Wetter, and in the south of the Sommen. It grows to a large size, often to 12 lb., sometimes to 15 lb. (but I never saw one nearly so large, and I do not consider the size as having anything to do with determining the species, because I am certain in many Scandinavian lakes the common charr runs to 10 or 12 lb.). Even of this *S. salvelinus* there appear to be two forms—the one they call the "livrée röding," which, according to Nilsson, never goes out of the lake into rivers which fall into it (by this it would appear that the other form is partially migratory); spawns throughout the whole of October on a stony or sandy bottom, in a depth of about a fathom. The flesh of this "livrée röding" is red, fat, and well tasted. The other form, which they call the "blank rödingen;" spawns at the same time, but always on a muddy or clayey bottom, in thirty to forty fathoms. This is smaller than the other, and the flesh is white and poor.

The fin ray formula in the *S. salvelinus*, carefully reckoned in many species, was as follows: D. 13; P. 13; V. 9; A. 12; C. 19—8,7; scales on the lateral line, according to Nilsson, are 120. This does not at all agree with Dr. Gunther.

Nilsson gives us two other varieties of the charr, *S. carbonarius*, Strom, and *S. rutilus*, Nilss, both peculiar to some lakes in south-west Norway, which are, however, clearly nothing more than varieties in colour of the common charr, *S. alpinus*, L.

Gen. *Osmerus*, Art.

This genus is distinguished by the transparent body (having a peculiar cucumber like scent); thin scales; large eye; projecting lower jaw, and adipose fin placed over the front division of the anal fin; small fish, rarely exceeding one foot in length; habits like the salmon, but in Scandinavia they principally live in fresh water during the whole year.

A.—*Osmerus.*

Large canine teeth in front of the vomer and on the tongue.

97. Osmerus Eperlanus, L. Slom; Nors. The Smelt. D. F.

Fin rays: D. 10—12; P. 11—12; adipose fin higher than it is long.

In Wermland we call the large smelts, slom; the smaller ones, nors; they are, however, decidedly the same species. The slom generally runs to about the length of 8 or 10 in., but I have seen a specimen 14 in. long. The nors rarely exceeds 4 in. Both forms are met with in all the large inland lakes in the middle of Sweden, and it is very doubtful whether the real smelt is found in Norway. With us they remain in fresh water throughout the whole year. Nilsson says the two forms do not appear to associate, even in the spawning season. I have, however, in the same cast of the net, taken specimens of smelt of all sizes, from 3 in. and less, up to 8 and 10 in. long. I have seen both spawn and milt in examples not 4 in. long. They spawn in the Wener early in spring, often before the ice breaks up, and generally in stormy weather, and a snow storm at this season with a high wind is called by all the residents around the lake a "nors il," or smelt storm. They are said in the Wener occasionally to be taken on a hook, but such a circumstance never came under my observation. Colour, back greenish, sides silvery. Br. 8; D. 10; P. 8; V. 11; A. 16; C. 19.

B.—*Mallotus,* Cuv.

No canine teeth.

98. Osmerus Arcticus, Fab. Lodda. F.

Fin rays: P. 18; D. 14; A. 22; adipose fin more long than high.

This species, which much resembles the common smelt, but is generally a little smaller, has its peculiar home in the Polar sea, and has only on solitary occasions been taken in the south of Norway or the Cattegat. They live entirely

in the sea, but in May or June countless thousands come up on to the northern coasts of Finland to spawn, followed by shoals of cod and other fish, who prey upon them. The scent of the lodda is even stronger than that of the smelt, and highly attractive to the large fish of prey, on which account they are in such request for bait, that in 1786, when the great cod fishery off Lofoden was in the hands of the Danes, it was forbidden to use this fish as bait because all could not procure it.

Colour: on the back green, on the sides silvery white; the position of the scales forming longitudinal bands along the sides. The Scandinavian specimens have not exceeded 8 in.

Gen. *Thymallus*, Cuv.

(All the species of the *salmonidæ* which have been hitherto described, are characterized by a wide gape, and sharp teeth. The three next genera, *thymallus*, *coregonus*, and *argentina*, have a very small gape, very few teeth, but the body on the contrary is covered with much larger scales). Breast armed with a band of scales, which stretches far beyond the pectoral fins; dorsal long and high.

99. Thymallus vulgaris, Cuv. Vanlig Harr. The Grey-ling. D. F.

May always be distinguished by the long high dorsal fin, with 20 rays, and the dusky longitudinal streaks along the sides of the body, as well as by the long dorsal fin; scales on lateral line, 90 to 92; scales large, lie in longitudinal rows.

Is principally confined to the northern lakes and rivers, and although I have met with small ones in the Klar, near its outlet into the Wener, I never saw them taken further south. They spawned with us in May, in Lapland in June. The largest I ever saw was one I took at Quickiock, which weighed above five pounds.

Colour grey-brown; sides blueish with a silvery tinge,

dotted with small black spots. Br. 10; D. 21; P. 15; V. 10; A. 13; C. 19.

Gen. *Coregonus*, Art. The Gwynniad.

General appearance that of a large herring, with an adipose fin; teeth either altogether absent, or very small; the whole head and gill covers totally devoid of scales; first dorsal short; more high than long.

Most of this genus are partial migrants to the sea, but all spawn in fresh water.

This is another class respecting the identity of the members of which the greatest confusion has hitherto existed. It is impossible, from the variety and misapplication of the synonymes used by different authors when describing the different species, to say which the synonyme properly belongs to, and although of late many of our naturalists have turned their attention to this genus, much still remains to be done before we can even say how many different species of gwynniad we have in Sweden. I shall refer to the various authors who have devoted much time to the study of this fish, and by comparing their remarks we will see if we can throw any light upon this *vexata quaestio*.

Beginning with Mr. Lloyd, who has had good opportunities of studying the gwynniads in the south of the Wener, and who wrote on this subject in 1854. He first remarks that English naturalists assured him that not one of the Swedish specimens brought over by him was identical with those found in Great Britain.

In his "Scandinavian Adventures" he gives us descriptions and excellent figures of three different gwynniads which were all common in the Wener, and which he seems to consider as good and distinct species, and these are certainly the commonest and best identified of the Scandinavian gwynniads.

1. *Coregonus oxyrhynchus*, L. Näbb sik, Sw. *Thymallus Latus*, Bl.

The distinguishing characteristics of this fish, he says, are the remarkable elongations of the upper jaw, the

peculiar form of the mouth, the small eye, and the high shoulder.

2. *Salmo marœna,* Bloch. Löf sik, Sw.

The leading characteristics of this fish are that the length of the head, as compared with the length of the whole fish, from the nose to the end of the fleshy portion of the tail, is as one to four and a half, that the length of the head is equal to the depth of the side of the body between the dorsal and ventral fins, that the orbit of the eye is so large as to equal one-fourth of the whole length of the head, that the lateral portion of the inter-maxillary bone is long, being equal to twice the breadth of the nose in front, and that the snout is deep. It appears to spawn in the Wener about the middle of October, or ten days to a fortnight earlier than the *C. Oxyrhynchus.* Both attain a good size in the Wener; 7 or 8 lb.

3. *S. Lavaretus,* L. Hedge or Martensmess Sik, Sw.

Also very common in the Wener, the leading characteristics of this fish are as follows: the length of the head, as compared with the whole length of the fish, from the nose to the end of the fleshy portion of the tail, is as one to six; the length of the head considerably less than the depth of the side of the body; the inter-maxillary bones short, the posterior edge not reaching in a vertical line to the anterior edge of the orbit of the eye; the eye small; the snout less deep than that of the supposed *S. marœna* in specimens of equal length.

This is the smallest of the three, rarely exceeding one foot in length, and is said to spawn about the middle of November, some even in the beginning of December.

Besides these three, he gives us the *coregonus albula* or vendace, and these are the only four species which seem to be known to him; but we must recollect that he is only referring to the fishes of the south Wener, and does not appear to have studied the ichthyology of Scandinavia further north.

Now, Mr. Lloyd is a man whose opinion is entitled to the greatest respect, for he has not only studied the habits of

the Wener's fresh-water fish for many years, but, when he published his "Scandinavian Adventures," he had all his specimens over in London, laid them before his friend Mr. Yarrell, and took his opinion; it is odd if two such men could not arrive at something like a just conclusion. Without, therefore, denying that the two new species which have lately been added to the Scandinavian fauna, and to which I shall hereafter refer, are good and distinct, I for one am inclined to place my faith more upon Mr. Lloyd's opinion in this particular than any other naturalist; and I therefore take it for granted that these three are good and distinct species, and are the common Scandinavian gwynniads which are found more or less dispersed over the whole face of the country.

Nilsson, in his "Scandinavian Fiskar" (1855), divides them as follows:—

A.—Upper maxillary projecting, or both jaws alike.

C. oxyrhynchus, L. Stor sik. Of this we have two varieties, very difficult to distinguish from each other—

(*a*). *C. oxyrhynchus*, Bloch. Nabb sik. Nose pointed, fleshy, much projecting; nostrils much nearer the eye than the point of the nose.

(*b*). *C. marœna*, Bloch (?). Knubb sik. Nose blunt, but still projecting beyond the gape; nostrils right between the point of the nose and the eye.

C. lavaretus, Nilss. Prod. Gra sik. *La coregone lavaret*, Val.

Nilsson's three forms or species are clearly the same as those described by Mr. Lloyd, for both their descriptions agree in every main point, the only difference between the two being that Nilsson considers Mr. Lloyd's "löf sik" as only a variety of the näbb sik, not a distinct species. I will only refer the reader to the two splendid engravings of these fish in Lloyd's "Scandinavian Adventures," and I think he will agree with me that the difference in the shape of the

noses of the two fish, as well as the difference in the size of the eyes and shape of the upper maxillaries (if constant, and they without doubt are so), are quite sufficient of themselves to constitute two good and distinct species.

Nilsson gives us a fourth species, *Coregonus Nilssonii*, Val. (blå sik), and he also describes a second species of vendace, *C. wimba*, L. (sik wimma); but of these two fish more hereafter.

Dr. Widigren, who has lately published a treatise on the Scandinavian *salmonidæ*, says—"Of the Swedish *coregoni*, which have the upper jaw longer than the under, we can discover three which have different forms at all ages, and which, even in the same water, hold themselves distinct from each other; and these we must consider distinct species, viz.:

"*C. oxyrhynchus*, L. Head small, thin, and pointed. Called in the Wener näbb sik, fit sik; Wetter, asp.

"The rarest of all in Sweden. I only know of three certain localities—the Baltic, the Wetter, and the Wener.

"*C. fera*, Jar. Knubb sik, Nilss. *C. Marœna*, Bl. Löf sik. (Wener).

"Nose, as it were, cut off square. According to my experience, is found in all the three above-mentioned lakes, and, by all accounts, it is the species which in Lapland is called the stor sik.

"*C. lavaretus*, L. The Powan, Yarr. Sw., Sik grå sik. Is the commonest and widest spread of all the Swedish gwynniads."

B.—Jaws even.

C. Nilsonii, Val. Is, next to the following, the smallest of all the genus. Specimens of 140 mm. long, which I took in Saggat Trask, up at Quickiock, in June, had already such large roe that they would doubtless have spawned in the following autumn.

The most characteristic mark of distinction in this species is the form of the head and nose. On account of the flat forehead, and the shape of the under jaw, it rather resembles

C. albula. In the dimensions it comes nearest to the following species, from which, however, it can easily be distinguished by the eyes, which in *C. Nilsonii* are considerably smaller than in *C. megalops.*

C. megalops, N. Sp. Both jaws alike; the breadth of the upper maxillary more than its height. Nose and forehead broad, but the nose in front of the eyes is curved down. Eyes large, equal to about one-third of the length of the head; body form more round and even than in any other of our gwynniads. The upper maxillary extends to the front edge of the eye, which lies more than one eye diameter from the point of the nose. The dorsal is higher in proportion than in any other Scandinavian species. D. 14; P. 15; V. 11; A. 16; C. 19; scales on lateral line 92. Colour above dark soot brown, with a very slight silvery tinge; belly and sides reddish, silvery.

Is the rarest, as well as the least of all the species. The largest I have seen have not exceeded 200 mm. in length.

He gives very fair reasons why this fish differs from the young of any other Scandinavian sik, and says that from the form of the upper maxillary it appears to come nearest to *C. Pollan,* Thompson, but in this latter the eye is much smaller than in the *C. megalops.*

I shall now quote a few extracts from Malmgren's "Fish of Finland" (1863), in which he remarks—

"Till now the *coregoni* have been but little known. Professor Nilsson has to one species joined at least three good species: *C. oxyrhynchus,* L.; *C. lavaretus,* L.; and *C. fera,* Widigren (not Jurine); and has taken as a distinct species the young of the true *C. lavaretus,* L."

As Finnish species he gives us—

1. *C. lavaretus,* L., Kroyer, Nilss. Siiki, Fin. *C. oxyrhynchus,* v. B. Knubb sik, Nilss., p. 433. The Powan. *C. cepedei,* Parn., Yarr., "British Fishes," i. p. 314.

This is the commonest species in Finland. Is met with in great quantities both in the gulfs of Bothnia and Finland, from whence they come up the rivers to spawn. General

weight 1 to 3 lb. We see by his synonymes that he considers this Finland fish as identical with the British powan.

In the south of the Baltic it appears that this species answers to the German "schnäpel," which is the true *C. oxyrhynchus*, L. This last-named species is met with also in the lakes Wener and Wetter, in Sweden, on the Swedish shores of the Baltic, and probably also on the south-west coast of Finland.

He describes this latter under the synonymes of—*C. oxyrhynchus*, L.; *S. lavaretus* (der Schnepel), Bloch.; *C. oxyrhynchus*, Val., Kroyer, Siebold, and Widigren.

2. *C. marœna*, Bloch., not Nilsson. Walkea suki. *C. fera*, Widigren.

Common in Ladoga. General size 5 to 10 lb. His description exactly agrees with Mr. Lloyd's, and he, moreover, says that he fancies this is the true Lapland gwynniad.

3. *C. Widigreni*. Walamka suki. *C. fera*, Widigren nec Jurine.

Is met with in the deepest parts of the north of Lake Ladoga, and is taken during the spawning season in fifty to one hundred fathoms. Dr. Widigren has had the goodness to send me a specimen of his *C. fera* from the Wetter, and after a careful examination, I can safely identify his *C. fera* with my *C. Widigreni*, from Ladoga. But I am obliged to give this a new name, because Widigren's *C. fera* not only includes this species, but also the foregoing, *C. marœna*, Bl. Moreover, the name is wrong, because Jurine's *C. fera*, from Bodensjon, has, according to Rapp's description, a shorter and higher head and shorter fins. From all this *C. fera*, from Bodensjon, appears to come much nearer our *C. marœna*, Bl., than our *C. Widigreni*, which is identical with *C. Widigreni*, from the Wetter. Siebold fancies that *C. fera*, Jurine, is a local form of *C. marœna*, Bl.

4. *C. Nilsonii*, Val. Is also met with in Ladoga, and in this lake all the Finland species of gwynniad live together.

5. *C. albula*, Nilss. In the Ladoga attains a length of 12 to 14 in.

He adds that two other species or forms of vendace are

met with on the coasts near Archangel—the one called by the Russians "nelma," which appears to be identical with *C. nelma*, Pall.; the other taken by Liljeborg, and by him supposed to be *C. clupeoides*, Pall.

It would therefore appear that now our modern Swedish naturalists suppose that we have five distinct species of gwynniad in Scandinavia, besides the "sik loja," and without entering into the question as to whether this new *C. megalops* is a good species or not, it will be best to include it in the list as a species, and leave it for a matter of future investigation.

I believe the three first described to be good and distinct species, viz.:—

100. C. Oxyrhynchus, L. Nabb Sik. D.

101. C. Maræna, Bl. Löf Sik. F.

102. C. Lavaretus, Nilss. Grå Sik. D. F.

For diagnoses of these refer to the introductory remarks.

Certainly these three are the common species of gwynniad peculiar to Scandinavia.

103. C. Nilsonii, Val. Blå Sik. F.

Is a small species, rarely exceeding 11 in. in length; head small, pointed; eyes large; the point of the nose flattened, double as broad as it is high; both jaws nearly of an equal length; inter-maxillary bone bent on the front edge, and projecting beyond the tubercles of the nose; ventrals without any axillary scales; scales on the lateral line, 55 to 87; colour dark brown shifting into steel blue (whence its Swedish name of blå sik), gradually assuming a silvery tint on the sides; below white not silvery; dorsal and caudal brown-grey; under fins white; the ventral and anal with blackish points; the body lancet-shaped. A. 14,15; P. 14 or 15; V. 12; A. 15; tail deeply cloven. (This is Nilsson's description.)

Nilsson remarks that this species ought to be carefully compared with two British species of gwynniad.

Is principally found in "Ringsjö," a lake in the south

of Sweden, where it remains all the year. It is also probably a native of other Scandinavian lakes, for Valenciennes has even obtained specimens from Norway.

They spawn in November, and the spawning season lasts till the middle of January.

Of Widigren's *C. fera*, Jur., Malmgren appears to make a new species, which he calls *C. widigreni*, *C. fera*, Wid.; and he says: "From *C. maræna*, which it otherwise much resembles, this species differs on account of its longer head, its more slender form of body, and the different shape of the nose, its smaller size, and later spawning season (end of November and December). The head, as well as the body, is more lengthy in proportion, but not so "spool" shaped as in *C. lavaretus*, but reaches its greater height at the back of the head; the nose, seen from the side, appears triangular; scales on the lateral line 90; usual size 1 to 3 lb."

He refers to *C. fera*, Wid. (nec Jurine), Wid. 1862, Fab. 18, p. 64.

Now there seems some discrepancy here. I have before me Widigren's "Bidrag till kännedom om Sverigos Salmonider," in the "Ofversigt of Kong vet Akad, Forhand" for February 1862, and here he certainly notices only the five species which I have mentioned above, nor can I see any thing in his description there which leads me to suppose that the fish which he describes as *C. fera*, Jur., and to which he gives the synonyme of *C. Maræna*, Bl., and the Swedish name of "knubb sik," is meant by him to be considered as a new species, or anything more than the *C. maræna*, Bloch, as described by Mr. Lloyd; for he gives it the Wener name of the "löf sik" as well as "knubb sik," and except as regards the spawning season, both their descriptions of this fish seem to agree, especially as regards the eye, one of Mr. Lloyd's chief marks of distinction. So whatever they may consider in Finland, I think no naturalist here wishes to make *C. fera*, as described by Widigren, a new species, or anything more than the common "löf sik," of the Wener.

I cannot make out what Malmgren means by alluding to the smaller size of this fish as a specific mark of distinction. Widigren in his above quoted description says nothing of its smaller size. According to Lloyd, the löf sik of the Wener attains an equal weight with *C. oxyrhynchus*, 7 to 8 lb.

On this interminable question of the identity of the different species of *salmonidæ*, it appears that the rising generation of naturalists are now all at once going to settle it by jumping at conclusions which the naturalists of the past generation had to puzzle out by very slow degrees. I think that the British icthyologists, at least, will be interested in some of the remarks which I have quoted on this subject.

104. C. MEGALOPS, Wid. N. Sp.

See my preceding remarks on this new species.

If we acknowledge this as a good species, and Malmgren's conjecture that Widigren's *C. fera* which he (Malmgren) includes in the list of Finland gwynniads as *C. Widigreni*, turns out correct, we shall have six species of gwynniad in Sweden, besides two forms, if not distinct species, of vendace, but as I have before remarked, it is excessively difficult, especially among the younger and smaller examples of this family, to decide which is a species, and which a mere form or variety.

C. Under jaw projecting.

105. COREGONUS WIMBA, Nilss. Sik Wimma. Ånims Wimma.

Body undersized; its height greater than the length of the head, which is as one to six of the length of the body; upper maxillary broad, and ends under the front edge of the pupil of the eye; scales on the lateral line about eighty; usual length 9 to 10 in.; colour above dark green, tinged with blue; sides silvery; opercle yellowish; fins small. D. 12; P. 16; V. 12; A. 15.

There is a question whether this is a distinct species or

only a variety of the *C. albula*, or vendace. Be this as it may, it seems as yet only to have been met with in one place in Scandinavia, the lake Anim, in Dalsland, where Linnæus first discovered it, and where the fishermen distinguish it from the common vendace by its brighter scales, its smaller eyes, and different form of mouth. They never appear to migrate, but always keep in deep water, and *never* approach the shore. They spawn in the end of October, and the spawning season lasts two months.

106. COREGONUS ALBULA, Val. Sik Löja. The Vendace. F.
Body lengthened, round, compressed at the sides; its height less than the length of the head, which is as one to five of the whole body length; usual length 5 to 6 in.; colour and fin ray formula as in the last.

Is met with in most of the lakes in the middle of Norway and Sweden, and goes far up into Lapland. In our midland lakes they spawn about November and December.

Gen. *Argentina*, Art.

Much resembling the smelt in appearance, but the position of the dorsal fin before the ventrals will at once distinguish this genus. Live only in the sea, and except, as young fish, never approach the coasts.

107. ARGENTINA SILUS, Nilss. Större Silfver Fisk, Sw. Gull Lax. Las Sil, Norw.
About 18 in. long; sides of the body in the young fish silvery white, in the older ones yellowish; scales broad, sharply serrated at the hinder edge. Fin rays: D. 11; P. 17; A. 14—15; vertebræ 65; eye very large, equal to one-third of the length of the head.

Is found on the western coast of Norway, especially off Bergen, where they occasionally attain a length of two feet; in summer they live at the depth of eighty to a hundred fathoms, in company with the *sebastes*.

The spawning season is not precisely known, but is probably either in autumn or spring. May be considered a rare fish.

108. ARGENTINA HEBRIDICA, Yarr. Mindre Silfver Fisk. The Hebridal Argentine.

Rarely exceeds 7 in.; the body more lengthened than the last; the head and eye smaller. Fin rays: P. 13—14; A. 12—13; vertebræ 52; colour silvery, tinged with brown.

Has as yet only been caught in one place off the Scandinavian coast, in Christiania Fjord, where it is taken not unfrequently at a depth of twelve to fifteen fathoms, and is known by the name of "stromsild;" has a cucumber scent, like the smelt. It is not known when they spawn, but a specimen of eight inches, taken in June, was full of roe.

Gen. *Scopelus*, Cuv.

Small sea fish, something in the shape of the minnow, but the under jaw is very projecting, the eye very large, and they may always be known by the row of silvery spots along the sides and belly; the adipose fin is scarcely perceptible, being nothing more than a long low skin lobe over the hinder division of the anal fin; silvery scales, large, round, thin, and easily peel off.

109. SCOPELUS BOREALIS, Nilss. Nordisk Prick Fisk. The Pearl Side.

Length about 3 in. Is rare in these seas, but is occasionally taken in the Cattegat and off the west coast of Norway; pectorals under the edge of the subopercle; between the ventrals and gills a row of twelve spots; head much shorter than the greatest height of the body. Fin rays as in the last.

110. SCOPELUS GLACIALIS, Reinh. Ström's Prick Fisk.

Described by Ström as "en liden rar fisk." Head no longer than the greatest height of body; ventrals exactly half way between the point of the nose and the end of the anal fin; between them and the gills a row of five spots; pectorals behind the posterior edge of the opercle; length 2¼ to 3½ in.; colour greenish brown; sides silvery. D. 10; A. 17; P. 15; V. 8.

On the Scandinavian coast only one specimen of this little fish (which evidently belongs to the North Greenland seas) has been taken, and this was many years since, off the strand, in Söndmör, West Norway.

Gen. *Sternoptyx*, Herrm.

Body compressed, high, scaleless, silvery, with a thin, bony keel along the abdomen, and a shorter one on the back; mouth large; preopercle with one spine; one short dorsal, and behind that a rudimentary adipose fin, as in the last genus; anal long; tail deeply cloven.

111. STERNOPTYX OLFERSII, Cuv. Olfers Platt Fisk.

A double row of four spots under the root of the tail fin, and twelve along the side of the abdominal keel. A rare tropical fish, generally about 2 in. long; colour along the back dark, for the rest the whole colour appears to be silvery. Br. 9; D. 9; P. 10; V. 6; A. 12; C. 19.

Two specimens have been taken on the coast of West Norway, probably brought up there by the gulf stream. Many rarities are carried to far distant coasts from the land to which they belong, through the agency of this gulf stream. For instance, the seeds of the American *Mimosa Scandens, Dolichos urens,* etc., are frequently taken off the coast of Heligoland.

And here I will quote an excellent remark of Professor Bell's, in his work on British reptiles :—

"The single, and purely accidental, occurrence of a bird or of a fish within the range of our guns, or of our nets, has always been deemed sufficient warrant to constitute the wanderer fair game to our native faunists. It may, perhaps, be doubted whether the important and interesting subject of the geographical distribution of animals can receive much illustration from thus swelling the catalogue of local species by the addition of such as owe their place in our fauna rather to the caprice of the winds or the waves, to the violence of a storm, or the temptation of an unusual chase after their food,

than to any regular and voluntary migration; nor does there appear any very sufficient reason for distinguishing between those species of birds, for example, which are driven to our coasts by the immediate force of the tempest, and those which are brought from the same countries, and wafted hither by the same impelling power, but through the medium of the sails of a ship, and secured by the safeguard of a cage."

Fam. 5.—Clupeidæ.

Rather resemble many of the family of the *cyprinidæ* in shape and appearance, but every member of this family has considerably more branchiostegous rays, usually six to eight, one species as many as fourteen: abdomen compressed, the scales on the margin forming a serrated ridge; scales large and thin; fins small; one single dorsal, with the pectorals directly under it. All live in the sea.

A. Under jaw projecting.

Gen. *Clupea*, L.

Body without spots; mouth small, directed upwards. The position of the ventrals, close to the dorsal fin, forms the safest distinguishing character between the members of this family.

112. Clupea harengus, L. Vanlig Sill. The Herring. D. F.

Ventrals placed under the middle or foremost third division of the dorsal fin; abdominal keel not deeply serrated. Br. rays 6—8; anal 16 to 18 rays. Length 7 to 15 in.

Several different forms of herrings are taken off these coasts, which are named after the localities and the seasons of the year in which they are taken. The largest and best are those caught on the Norwegian coast; the smallest are in the Baltic, and one form, called the strömming, never exceeds 8 in. in length.

They come on to these coasts to spawn at very different seasons of the year. The large Norwegian winter herrings

begin to approach the coast in January, and leave in April; but the form which they call the summer herring comes on to the coast in July or August, and spawns about October, and the small form in the Baltic spawns in May and June; up the Bothnia, at Umea, the strömming spawn in the middle of July.

The herring fishery on the Swedish coasts is now very inconsiderable, as compared to what it formerly was.

113. CLUPEA SPRATTUS, L. Skarp Sill. The Sprat. D. F.

Dorsal placed further back than in the herring; the ventrals beneath its hinder division; keel of the abdomen deeply serrated; length 5 to 6 in.; anal fin with 20 rays.

There are two forms of sprat which, Nilsson observes, might well be taken for two distinct species—the one a northerly form, body smaller and more elongated, with the head longer than the greatest height of the body; from the coasts of Stockholm and Norway. The other is more broad, with a shorter head, which is not equal to the greatest body height. From the Sound and coast of Scania. Is met with (never in such large shoals as the herring) all round these shores, from the north of the Baltic in the east to north of Bergen on the west.

Spawns principally about Michaelmas. The most are taken off the Norwegian coast in October. It is of this fish that the far-famed Norwegian anchovies are made. According to Sundevall, they spawn off the Stockholm coast in July.

114. CLUPEA PILCHARDUS, Bl. Sardin (eller) Pilchard. The Pilchard.

No teeth, as in the herring or sprat; dorsal exactly in the centre of gravity, with the ventrals placed under its middle; two oblong patches of scales on the sides of the tail fin; anal fin with 18 rays; keel of the abdomen not so sharp as in the herring, which in general appearance it much resembles, but the body is thicker and rounder; length 9 to 10 in.; scales very large, 7 to 8 in one transverse row.

Only one single example of this fish appears to have been taken off any Swedish coast. It was caught off Kullen, in the south of Sweden, and was a female full of roe; about 10 in. long.

It is this species that forms the sardines of commerce, and the principal bait used to take them off the coasts of Brittany is salted codfish roe from Lofoden.

Gen. *Alosa*, Cuv.

Distinct teeth in the jaws; upper jaw notched in the middle; a row of dusky spots along each side of the body; scales small; about 18 in one transverse row; length 14 to 18 in.; otherwise more resembling the pilchard than any other.

115. ALOSA FINTA, Cuv. Vanlig Stam Sill. The Twaite Shad. D.

Is rare; principally taken in the Cattegat and Sound, now and then in the south of the Baltic, but never far up.

B.—Upper jaw projecting.

Gen. *Engraulis*, Cuv.

Body elongated; mouth large; gape extending far beyond the back of the eye; branchiostegous rays 12 to 14.

116. ENGRAULIS VULGARIS, Nilss. Ansjovis. The Anchovy. D.

Body without spots, with a silvery gland; teeth very fine; ventrals placed in front of the dorsal fin; an oblong scale on each side of the tail; length 6 to 7 in.

Is very rare in these seas, and only found on the west from Kullen to a little way up the Norwegian coast.

Division 2.—THORACICI.

Ventrals placed a little before or immediately beneath the pectorals.

Fam. 1.—GADIDÆ.

Body of the usual form of fish well proportioned or

lengthened; scales in all, except about three genera, soft, small, and weak; mouth large, full of sharp teeth; gill openings large, with seven rays.

Are all (with the exception of the burbot) sea-fish, and usually live in shoals.

COD-FISH.

1. Ventrals placed in front of the pectorals

A.—Three dorsal and two anal fins.

Gen. *Gadus*, L.

Crista sagittalis upright and single; three dorsal and two anal fins, covered with small scales; caudal distinct.

a. Upper jaw projecting.

(1). With one barbule under the chin.

117. GADUS MORRHUA, L. (old fish); G. CALLARIAS, L. (younger fish). Torsk. The Common Cod. D. F.

The northern cod differ so much in colour, that on these coasts we have four different forms, all known to the fishermen by different names—

1. Gra Torsk (Grey Cod). This is the most common. Colour white-grey or grey.

2. Gräs Torsk (Grass Cod). Greenish or olive-coloured.

3. Berg Torsk (Rock Cod). Reddish, with red fins.

4. Svart Torsk (Black Cod). Black or blackish.

In all, however, the lateral line is white.

Mr. Couch inclines to the opinion that *G. callarias*, L., is a distinct species, and figures it as "The Dorse." D. 13 + 18 + 19; A. 19 + 17.

This is the commonest of the genus, and is met with on all the Scandinavian coasts. On the southern coast they spawn about April. The cod here runs to a large size, 2 to 4 ft.; body patched and spotted all over with minute dark spots; anal opening under the front edge of the middle dorsal; eyes much smaller than the distance between them and the tip of the nose.

118. G. LUSCUS, L. Bred Torsk. The Bib Pout. D.
May be at once known from any other member of the family by the depth of the body, which is more than the length of the head, and the long anal fins, the first of which commences nearly in a line with the first dorsal. Is rare in Scandinavia, and scarcely ever exceeds a foot in length. D. 12 + 20 + 30; A. 29 + 20. The lateral line is black, and there is a black spot at the origin of the pectorals, as in the whiting. Size of the eyes equal to the distance between them and the point of the nose.

119. G. MINUTUS, L. Glys Torsk. The Power, or poor, Cod. D.
This, the smallest of all the family, rarely exceeding 8 to 10 in., may be known at a glance from the last, which it otherwise much resembles, by the shorter first dorsal fin, and by its different position, which is entirely before the first anal. Is never met with in the Baltic, rare in the Sound, and not common anywhere in these seas, although it is found, I believe, all through the year on the coast south of Gothenburg, and as far up as Bergen. Anal opening under the hinder edge of the first dorsal fin; eyes much larger than the distance between them and the point of the nose. D. 13 + 21 + 20; A. 26 + 21.

120. G. ÆGLEFINUS, L. Kolja. The Haddock. D. F.
May always be known by the white colour, the black lateral line, and the large black spot under the first dorsal. Is common in the Cattegat, Sound, and North Sea, even as far up as Tromsoe, but never in the Baltic. Usual length here 12 in. to 16 in., but they are occasionally taken as large as 2 ft. Anus placed under the front edge of the middle dorsal fin. D. 15 + 22 + 21; A. 25 + 22.

(2). With no barbule under the chin.

121. G. MERLANGUS, L. Hvitling. The Whiting. D.
Is known by its silvery colour, and the black spot over

the root of the pectoral. Usual size here 8 in. to 12 in., but they have been taken up to 18 in. and 20 in.; anus under the middle of first dorsal. Is met with on all these coasts, from the south of the Baltic to far within the Polar circle. They never here, appear to flock together in large shoals, even in the spawning season, nor do they wander much, but remain throughout the year about the spots where they were born. D. 14 + 21 + 20; A. 34 + 23.

b. Under jaw projecting.

(1). With no barbule under the chin.

122. G. POUSTASSO, Riss.; G. MELANOSTOMUS, Nilss. Kolmule Hvitling. Couch's Whiting.

General characters of the whiting, but the under jaw is longer, the back is darker, and the eye nearly double the size of that in the common whiting; the three dorsal fins, instead of being placed together, are set wide apart, and the space between the hinder and middle fins is more than the length of that fin. Inside of the gill covers, black. The Norwegian specimens are usually from 10 in. to 18 in. long; anus long, before the first dorsal. Is taken occasionally off the south-west coast of Norway, where, according to the fishermen, they do not go up into shallow water, and are never taken in any great numbers. D. 13 + 14 + 24; A. 38 + 25.

123. G. CARBONARIUS (old fish); G. VIRENS, L. (young fish). Grå Sej. The Coal Fish. F. D.

Resembles the pollach more than any other species, but the lateral line is straight and white, the eye is very much smaller, the tail more deeply forked, the fins all appear larger, and the greenish black colour of the back of the old fish, mingles by degrees with the silver grey of the sides; anal opening under the back division of the first dorsal fin; mouth black inside. Colour varies so much with age, that for a long time the young

fish was considered as a distinct species, under the name of the green cod. The green colour on the back of the young fish, and the yellow sides, appear to give place to a darker tint, when the fish has reached the length of about 10 in., and it becomes blacker every year as the fish increases in age.

Is a common fish in all the Scandinavian seas, from the Sound up to the North Pole, but has never been taken in the Baltic. They appear to be most common, however, off Bergen, where they go by different names, according to the different seasons of the year. Under 6 in., they are called "mört," and are then taken in autumn in the shallow fjords off the coast. When they are 9 in. to 18 in. long they are called "pale;" in the second year, "små pale;" in the third year, "stor pale;" and the larger they are the further they keep from the land. In the fourth year they are called "sej," when they leave the coast and banks, and go out into the deeps. They are said to spawn at Christmas. Usual size of the largest 3 ft. to 3½ ft. Specimens of 3 ft. 8 in. weigh 20 lb. D. 13 + 19 + 20; A. 26 + 23.

124. G. POLLACHIUS, L. Blank sej. The Pollach. D.

Lateral line dark and crooked; tail fin slightly forked; the dark brown colour of the back and the silvery tinge on the sides, divided by a well-defined line; anal opening under the front division of the first dorsal; scales smaller than in the last. Is certainly very rare on the Swedish coast of the Baltic, but is more common the further we proceed up the western coast; and in the North Skärgard, off Gothenburg, they are met with at all seasons of the year, on a sandy bottom, among steep rocks, in ten to twelve fathoms of water. They are said to spawn in April. Length from 2 ft. to 3 ft. D. 12 + 20 + 19; A. 31 + 26.

(2). With a small barbule.

125. G. ESMARKII, Nilss. Små sej.

Might be easily confounded with the young of the

last, were it not for the presence of the small beard, which might, however, easily be overlooked; but the head is shorter, the eye and the scales much larger. In an oblique row, from the lateral line to the middle dorsal fin, fifteen scales can be counted; in the pollach forty. Tail small; anal opening under the hinder division of the first dorsal. Length 6 in. to 8 in. D. 16 + 23 + 23; A. 27 + 28.

Dr. Esmark relates that this little fish is not uncommon in Christiania Fjord, in Norway, probably also in many other places off the Norwegian coasts. Respecting its habits, nothing is known.

B.—With two dorsal and one anal fin.

Gen. *Merluccius*, Cuv.

Crista sagittalis cloven in front; body covered with large hard scales.

126. MERLUCCIUS VULGARIS, Flem. Vanlig Kummel. The Hake. D.

The flattened head, the round long body, the large scales, and the hinder division of the dorsal and anal fins, being higher than the front and rounded, will easily distinguish this species from any other of the cods. It is often taken in the northern seas four feet long, but usually it is smaller. Is not met with in the Baltic, seldom in the Sound, but in the Cattegat and North Sea it is more common, and it is taken far up on the west coast of Norway. Formerly they were far more common off the west coast of Sweden than at the present day, for now they are rare and principally taken (always on a muddy, never on a sandy bottom) on long lines in 100 to 120 fathoms. They are said to spawn off the banks in deep water in July and August, and never at any season of the year to come in on to the coasts. D. 10 + 38; A. 33; anus lies nearer the head than the point of the tail.

Gen. *Molva*, Nilss.

Body covered with small scales, lying in a slimy skin;

teeth large, in a single row; no perceptible crista sagittalis; tail widely divided from the dorsal and anal fins.

127. Molva vulgaris, Nilss. Långa. The Ling. D. F.

The longer body, the beard under the chin, the rounded tail, and the small scales, will always distinguish this species from the last. The ling attains a large size here, often measuring 5 to 6 feet. Is never taken in the Baltic, rarely in the Sound, but the principal fishery is on a bank about 16 or 18 Swedish miles off the Skaw, the northernmost point of Jutland, where it is taken during the summer on long lines, in dry weather in 150 fathoms, but in rainy weather it comes up into 40 to 60 fathoms. With luck, one boat in a week will take about 300 ling and large cod off this bank. These are salted and sold in Gothenburg as "klippfisk," or else as "kabiljå," for which latter purpose the ling are best.

128. M. Abyssorum, Nilss. Birke Långa.

Never attains so great a size as the common ling, which, however, it much resembles, but is easily distinguished by the following characteristics. The under jaw is considerably longer than the upper, the eye is much larger, and the forehead between the eyes is not so broad: moreover the body is thinner according to its length, and much more tapering to the tail. Br. rays 7; D. 14 + 76 to 78; P. 18 to 19; V. 6; A. 74 to 75.

In the common ling the fin ray formula is: Br. rays 7; D. 13 + 67; P. 18; V. 6; A. 58 + 66.

Is not found in the Cattegat; only in the North Sea, off the west coast of Norway. The common ling is only taken in deep water, far out at sea, whereas this species never goes far from the land, but is always met with in bays and fjords, though only in those which are deep and have a soft bottom.

Gen. *Lota*, Cuv.

Fins, scales, and crista sagittalis as in *molva*. Tail fin joined to the dorsal and anal fins; head flatter, and tail

much more pointed, than in the last; a small beard under the chin. Fresh water fish.

129. Lota vulgaris, Cuv. Lake. The Burbot. D. F.

Body piebald, brown and yellow; eyes small; jaws equal; in the midland rivers and lakes often reaches a weight of 12 to 14 lb. In the Wener they spawn in January, and this is the only time of the year they are in season. They are then taken in bow nets set under the ice, and are sold at from 1s. 6d. to 3s. for 20 lb. They are said to spawn at so young an age, that seven or eight will go to a pound. They are occasionally taken on night lines.

Stewed burbot is considered a great dish here; the liver is particularly large and fine. They are voracious, and very destructive to the roe of other fish.

Gen. *Phycis*, Art.

Characters of the *lota*, but the head is much flatter and broader; the body is much deeper, and the ventral fins consist only of a long single forked ray, like a thread; a small beard under the chin; ventrals always twice as long as the head; first dorsal high and pointed. Body covered with large scales; dorsal and anal fins as in the ling.

130. Phycis Furcatus, Flem. Vanlig Bartel. The Great Fork Beard.

The first dorsal more elevated than the second; ventrals twice as long as the head; body elongated; usual length here from 18 in. to 2 ft. D. 9 + 58; P. 16; V. 1; A. 51.

Is taken occasionally off the west coast of Norway.

Gen. *Motella*, Cuv.

First dorsal scarcely perceptible; barbules on the top of the snout, as well as on the chin; body long, as in the *lota*; scales small, lie in a thick slimy skin. Head depressed; colour dull, without gloss; resembles the burbot in shape.

131. MOTELLA TRICIRRATA, Nilss. Tretömmad Skärlånga. The Three Bearded Rockling.

Two beards on the nose, one under the chin; body strewed with large round blackish spots; usual length 12 to 16 in.

Never met with in the Cattegat, but occasionally on the west coast of Norway in rather deep water, on stony bottom. Spawns early in spring.

132. M. CIMBRIA, Struss. Fyrtömmad Skär Långa. The Four Bearded Rockling. D.

Three beards on the nose, one under the chin; tail pointed, rounded off; colour yellow-brown, with small black spots, and is easily distinguished at a glance from any of the others, by the greater length of the first filament in the anterior dorsal fin, which in a fish of 10 in. will measure above 2 in. The usual length here is 12 in.

Is occasionally, but rarely, taken in the Oresund, and off the west coast of Norway.

133. M. MUSTELA, Jenn. Fem Tömmad Skär Långa. The Five Bearded Rockling. D.

Four beards on the nose, and one on the chin; colour yellow-brown, unspotted; the lateral line distinctly marked by a series of short slender white streaks.

About the size of the last; appears to be the commonest and widest spread of all the genus on these coasts, and is taken on the Gothenburg Skärgard, as well as along the west coasts of Norway.

Head compressed, colour tinged with a silvery gloss.

134. M. ARGENTEOLA, Yarr. Silfver Färgad Skär Långa. The Mackerel Midge.

This beautiful little fish, which rarely exceeds 2 in. in length, much resembles the whiting in form and proportions, but may always be known by the silvery colour, and five barbules, four on the head. It much resembles the young of the last, but as Mr. Yarrell ob-

serves, presents in its economy some of the attributes of a species.

Has been taken off Christiansand in Norway.

Gen. *Raniceps*, Cuv.

Head depressed and very broad; body tapering off behind; the first dorsal consists only of three rays (the one large and two very small); a small barbule under the chin; scales very small, both on head and body; pectorals end in one or two fine threads; eye large; have a slight resemblance to a tadpole.

135. RANICEPS NIGER, Nilss. Svart Padd Torsk. The Lesser Fork Beard. D.

Black, with a white mouth; under jaw the longest, furnished with a little short beard; pectorals end with two fine white threads; usual length 9 to 12 in.

Is very seldom taken in the Sound, oftener in the Cattegat and North Sea. Always found near the bottom. Said to spawn between Martinmas and Christmas. D. 3 + 66; A. 60; P. 22.

C.—With only one dorsal and one anal fin.

Gen. *Brosmius*, Cuv.

Body like the cod; chin with a single barbule. May be distinguished from any other by the single dorsal fin.

136. BROSMIUS VULGARIS, Cuv. Vanlig Lubb. The Torsk. D. F.

Anal opening under the middle of the body; jaws of equal length; colour grey, with yellowish transverse bands; lateral line brown, crooked; usual length 2 sometimes 3 ft.

Is never taken in the Baltic or Sound, but is not uncommon in the Skaggerack and off the west coast of Norway. The northern parts of the North Sea appear, however, to be their peculiar home, from 58° to 72° north lat.

2. Ventrals directly under the pectorals.

Gen. *Macrourus*, Bl.

Body long, terminating in a very long, small tail, with no distinct fin; scales hard and sharp, carinated and spined; two dorsals; the first very high and short; second dorsal and anal, very long; both terminating in the small thin tail point; eyes large; one beard under the chin; head large; nose flattened, with the large mouth under it.

These fish differ from all the other thoracic fishes by the long, thin, pointed tail (giving them something the appearance of the northern chimera) and the immense eye.

137. MACROURUS NORVEGICUS, Nilss. Ströms Skoläst.

Scales hard and large, covered with fine spines; anal opening far in front of the beginning of the hinder dorsal; first ray of the first dorsal, spined along all the edges; colour silvery grey; iris yellow; inside of the mouth and gill covers, black; all the fins blackish; length 2 ft. 8 in. to 3 ft., but specimens are rarely obtained with a whole tail fin.

Is met with in the North Sea, from the south of Norway even up to the North Cape, but rare; most common in the tracts of Bergen. Is always in 80 to 120 fathoms. One example has been taken off the reef of Jutland. Is called off the Norwegian coasts "berg lax," or rock salmon.

138. M. RUPESTRIS, Bl. Fabricius Skoläst.

Scales carinated, and ending in a sharp point; anal opening placed further back than the commencement of the hinder dorsal; the first ray of the foremost dorsal round at the root only, denticulated on the point.

Is a Greenland fish; only one specimen is known to have been taken off any Scandinavian coast, and this was in 1839, at Hammerfest, not far from the North Cape.

Fam. 2.—PLEURONECTIDÆ.

Head with both eyes on the same side; body very high and compressed, usually with small thin scales; sides not

alike, the one coloured, which is turned obliquely upwards when the fish swims, the other white; anal opening far in front of the body, under the root or middle of the pectorals; dorsal and anal fins very long, extending along the whole of the back and the under part of the body, even from the pectorals.

They derive their name, *pleuronectis*, from their habit of swimming obliquely on their sides. But this is not peculiar to the flounders, for the *tenidæ* do the same. All sea fish.

The Scandinavian species may be divided into two groups:—

1. *Pleuronectes*. Both jaws perfect, and visible (not being hid in scales); the lower eye a little before the upper one.

2. *Solea*. Jaws hidden in a scaly skin; lower eye a little behind the upper.

Gen. *Pleuronectes*, L.

1. Teeth blunt, placed close together.

Anal spine wanting.

139. PLEURONECTES MICROCEPHALUS, Don. Pluddermun. Lemon Dab. D.

Jaws of equal length; body oblong, oval; lateral line straight; body altogether smooth. The handsomest of all the family. Colour light brown above, mottled with yellow; belly white; skin seems as if it were polished; head very small; lips swollen; length 12 to 18 in.; height nearly equal to the length of the body. D. 90; A. 74.

Is met with on these coasts from the south of the Sound up to Norway. Spawns here in July.

Anal spine present.

140. P. PLATESSA, L. Röd Spätta. The Plaice. D.

Under jaw longest; body rhomboidical; tail rounded; much resembles the flounder; but the smooth lateral

line and the large bright orange spots on the body are good distinguishing characters of this species; usual length 12 to 18 in.; varies in colour; height equal to half the length of the body. D. 70; A. 50.

Common in the Baltic up to Aland, the Cattegat and North Sea. Off the coast of Scania is met with the whole year, and principally caught in April, May, and June. Spawns in March and April.

There is a larger form in these seas which they call "hansing," from 2 to 3 ft. long, 1 ft. broad, and weighing 6 to 7 lb. These are principally taken off the Scaw in the autumn.

141. P. Flesus, L. Skrubb Skädda. The Flounder. D. F.

Lateral line rough; tail even on the margin; body more elongated than in the plaice; colour generally dark brown; varies much, often spotted, but the spots are always very small and indistinct; usual length under a foot; but the larger examples of 14 in. long and about 7 in. high, are called by the fishermen here "skrubb-slatta;" height as one to two in the body length. D. 57; A. 37.

Is the commonest of all the family, and in these seas the most widely spread, from Scania up into the Gulf of Bothnia on the east, and up to the North Cape on the west. Spawns about April.

142. P. Cynoglossus, L. Mare Flundra; Svart Fenad Skädda. The Pole.

Can scarcely be distinguished from the two last species, except by the more oblong oval form of the body, and the lower eye is further advanced; lateral line altogether straight; the body is smooth, of a uniform yellow-brown colour, and the pectoral fin is black on the eye side; length 1 ft. to 18 in.; height equal to one-third of the length. D. 110; A. 94.

The rarest of all the family on these coasts, and has only been taken in the south of the Cattegat; said to spawn

in the end of July. Is best eating in June, but never so good as the plaice.

2. Teeth more or less pointed, distinct.

143. P. LIMANDA. Sand Skädda. The Dab. D. F.

May be at once distinguished from either the flounder or the plaice, with which it associates, by the lighter brown colour of the body, the arched lateral line above the pectorals, and the roughness of the scales. The shape of the body resembles the flounder; usual length 10 in.; height scarcely equal to about one-third of the length. D. 70; A. 50.

Is common in the Baltic, Sound, Cattegat, and North Sea, as far up as 72° north lat. Spawns in May.

144. P. LIMANDOIDES, Bl. Ler Skädda. The Long Rough Dab. D. F.

The straight lateral line and the more elongated form of body will distinguish this from the last; the mouth also is larger; scales very rough; usual length 10 in.; height equal to about one-fourth of the length.

Is never taken in the Baltic, but not rare in the Cattegat and North Sea. Spawns in April and May; is best eating in May, but always inferior to the other species of flounder.

Gen. *Hippoglossus*, Cuv.

Body smooth; vomer without teeth; dorsal commences above the upper eye, and ends, like the anal fin, a considerable distance from the root of the tail; eyes placed to the right. Anal spine present.

145. HIPPOGLOSSUS VULGARIS, Flem. Halle Flundra. The Halibut. D. F.

Body more elongated and less flattened than any other species of flounder. The surface smooth; scales soft; colour above clouded, from light to dusky brown; length from 3 to 6 ft.; height equal to one-third, breadth to one-fifth of the length. D. 100; A. 76.

Is met with in all the Scandinavian seas, from the south of the Cattegat up to 72° north lat. Nilsson mentions a specimen which was caught off Vaderö, on the southern coast, which weighed 120 lb.

Gen. *Rhombus*, Cuv.

Vomer with teeth; body rough, rhomboidical, nearly as broad as long; eyes to the left; eye side of body, yellowish brown mottled, covered all over with small rough bony tubercles.

146. RHOMBUS MAXIMUS, Cuv. Pigg Hvar. The Turbot. D. F.

Is met with on all these coasts, both on the east and west to far north. Off the southern coast of Sweden is taken all the year round, but it is best from May to midsummer; its usual size is 10 to 12 lb., but is occasionally taken larger, even 2 ft., and weighing 17 lb.; and they say it has been caught off Kullen, in the south, up to 40 lb. D. 65; A. 46.

147. R. LÆVIS, Nilss. Slätt Hvar. The Brill. D.

Very similar to the turbot, but the body is quite smooth, and more oval. The specimen described by Nilsson was 21 in. long, 10½ broad, weighing 4 lb.; appears to be confined to the Cattegat and south of the Baltic, and is never taken in deep water; height equal to one-half of the length. D. 74; A. 54.

148. R. MEGASTOMA, Don. Stor Munt Hvar. The Whiff.

Body more oblong and elongated than either of the last; its height equal only to one-third of its length; mouth very large; scales on the lateral line tuberculated; the lateral line is double over the pectoral fin, one portion being a continuation of the straight line that traverses the body, the other taking a high curve over the pectoral; length 12 to 18 in. D. 87; A. 69.

Is met with only on the north-west coast of Norway, off Glesnar and Bergen, where it is called the *glas flundra*, on account of its transparent body; throughout the year in a

depth of eighty, to one hundred fathoms. Spawns in April and May.

149. R. CARDINA, Fries. Små Hvar. Ekstrom's Topknot. D.

Anal body pointed alike at both ends. Colour on the upper side yellowish brown, with irregular dark spots; scales ciliated on the edges. The dorsal, which begins just before the upper eye, has none of the foremost rays lengthened, and ends, like the anal fin, a little behind the root of the tail. Greatest height about one-third of the length.

Has only as yet been found off the Bohus Land coast, in Sweden, and the west coast of Norway.

In remarking on this fish, which has only just been added to the British fauna from one single specimen taken in the Bristol Channel in 1863, Couch observes: "There is much confusion in the two or three writers I have been able to consult on the fish to which I have assigned the English name of Ekstrom's topknot; and there cannot be a doubt that the name *R. cardina*, given to it by the Swedish authors in their works on Scandinavian fishes, is misapplied, as it bears little likeness to the species which is thus named by Cuvier, who refers to Jago's figure in Ray's 'Synopsis,' f. 2, where it is represented under the name of the whiff. This last-named fish, *R. cardina* of Cuvier, is the 'carter' of our work." (The whiff of Yarrell.)

In describing this new species, he remarks that "both eyes are nearer the snout than in *R. hirtus*, Yarr.; on the cheeks the scales are regular, and plainly visible, while they are not discerned in the *R. hirtus*; the pectoral is longer and more pointed, and the uncoloured side, as well as the cheeks, is covered with ciliated scales, which is not the case in *R. hirtus*."

Nilsson remarks that this species, especially when young, much resembles the whiff, but the form of the body is very different; and they may be distinguished from each other by the following characters:—

The Whiff.—Scales in the outer margin rounded, and rough on the top. In an oblique row above the lateral line 26 to 30 scales can be reckoned; under that, 24 to 26; on the lateral line, behind the curve, 64 to 66 scales. If the lateral line is drawn straight, at least ten scales lie in a row above that and up to the curve.

Ekstrom's Topknot.—Scales angular, only finely crenated on the outer edge. In an oblique row above the lateral line 18 scales; under it about 20; on the lateral line about 36 slimy scales. If this is drawn straight, 4 to 5 scales lie in a row above it up to the curve.

150. R. HIRTUS, Yarr. Luden Hvar. Müller's Topknot. D. Roundish oval; only the eye side of the body rough; edges of the scales crenated; jaws equal; the first dorsal ray not longer than the preceding ones; ventral and anal fins united; the dorsal and anal fins connected to the tail, by a membrane; eyes close together. In other respects, resembles the turbots. Usual length 9 in.; greatest height equal to half of the length.

Is met with sparingly, at all seasons of the year, in the Sound and Cattegat, and on the north-west coast of Norway, at least as far up as Bergen. Of its habits little appears to be known.

Bloch's topknot (*P. unimaculatus*, Bl.), which has never yet been identified on those coasts, has been probably overlooked. It may always be distinguished from Muller's topknot by the elongated first ray of the dorsal fin, by both sides of the body being rough, by the large eyes, and the separation between the ventral and anal fins.

Gen. *Solea*, Cuv.

Eyes to the right; no anal spine; dorsal commencing at the mouth, and reaching, as well as the anal, quite to the caudal.

151. SOLEA VULGARIS, Cuv. Tunga. The Sole. D. Oblong; eyes wide apart; scales small and rough. Colour of the upper part of the body dark brown; pec-

torals tipped with black; lateral line straight as far as the back of the head; irides golden yellow. Usual length 12 in. to 14 in., but occasionally larger; height one-third of the length.

Is rare in these seas, except off Bohus Land, where it is common, and called "sale." Is occasionally met with on the south-west coast of Norway, but its northern limit is not known. It is principally caught here from the beginning of April to the end of May. According to Ekstrom, spawns in May and June. The flesh is more palatable than any other of the flounders.

APODES. VENTRALS WANTING.

No ventral fins; body long, round, or compressed, covered with a thick hide; scales deeply embedded, scarcely perceptible.

Fam. 1.—AMMODYTIDÆ, Mull.

The long dorsal and anal fins distinct from the tail.

Gen. *Ammodytes*, L.

Body eel-like, round; small scales in a thick skin; snout sharp; caudal forked; gill opening very large.

All small fish, living on sandy shores, in which they bury themselves.

152. AMMODYTES TOBIANUS, L. Hvit Tobis. The Sand Eel. D. F.

Under jaw much longer than the height of the body; dorsal commences directly over the end of the pectorals; crown of the head flat. Colour dark green above; all the rest silver white; a dark spot on the cheek; usual length here 7 in., but they grow often to 12 in. or 13 in. D. 53; A. 28; P. 14; C. 16.

Common on all the sandy coasts of Scandinavia. About the spawning season, which takes place sooner or later in the summer, they come on to the sandy shores in shoals. The sand eels come into Ystad, in the south of Sweden,

where the greatest sand-eel fishery is carried on, to spawn in April, the sand launce in August; and in one parish here the yearly catch will be perhaps above 200 bushels. They appear in the winter to keep to very deep waters.

153. A. LANCEA, Cuv. Blå Tobis. The Sand Launce. D. F.

Is so much like the last, that for a long time the two species were considered as one. But the sand launce is always smaller, rarely exceeding 8 in.; the crown of the head is flat, the under jaw shorter, than the height of the body, the dorsal commences over the middle, or hinder part of the pectorals, and there is never a spot on the cheek; paler in colour than the last; no difference in the fin ray formula.

Habits and localities on these shores as in the last.

Fam. 2.—MURÆNOIDEI, Mull. Eels.

The long dorsal and anal join at the tail point, which has no distinct fin; bladder present.

Gen. *Anguilla*, Cuv.

Body dark coloured; not so silvery as in the last; slimy; scales hidden in the thick skin; dorsal commencing far behind the pectoral; upper jaw shortest.

154. ANGUILLA VULGARIS, Cuv. Sött Vattens Al. The Common Eel. D. F.

Is met with in most of the lakes and rivers of the south and middle of Scandinavia, and, according to Widigren, as far up as Lulea Lapland (but in no great numbers), where in August they leave the rivers for the coasts of the sea, and lie buried there during the winter.

According to Malmgren, they are common in Ladoga, and go up in Finland as high north as 64½° north lat. They attain a good size here. Respecting the different forms of species of eels, Malmgren, Sundevall, and Nilsson consider the length or shape of the nose as no *specific* mark of distinction. Sundevall says it is probably owing to a difference

of sex, and Nilsson, in his description of the common eel (to which he gives the synonyme of *Murœna anguilla*, L.), gives us three varieties or forms—1. The common eel (*Anguilla acutirostris*, Yarr.); 2. The snig (*A. mediorostris*, Yarr.); 3. The broad-nosed eel (*A. latirostris*, Yarr.); all which forms we have in Scandinavia. Kroyer, on the contrary, in his "Danish Fishes," gives three distinct species—*Anguilla migratoria*, Kroy.; *A. acutirostris*, Yarr.; *A. latirostris*, Yarr. Malmgren says there is decidedly only one species.

The following extract from a letter of Mr. Pinkerton ("Field," October 25th, 1862) is, I think, worth inserting here. He says:—

"There is no doubt that there are three distinct species of eels (at least) in the British and continental waters, all different in their habits and forms. The snig is more inclined to a yellow colour than the other two species, and is distinguished by its habit of roving and feeding by day, the others by night; and as the nose of the snig is not so broad as in the broad-nosed, nor so sharp as in the sharp-nosed eel, it has properly been called the *mediorostris*. Moreover, the first five cervical vertebræ are smooth and round, being entirely destitute of the superior and lateral spinal processes possessed by the two other species.

"Old women, when they go to market, prefer buying the delicately-flavoured long-nosed eel, rather than the rank, coarse, flat-nosed species, and the fishermen always obtain more for the former.

"The broad-nosed eel bites with a more violent, vicious tug than the other; and being one of the most filthy of feeders, emits a rank, strong smell when being cooked. The sharp-nosed eel is a much cleaner feeder. In the Lake of Geneva, where the sharp-nosed eel abounds, the blunt-nosed has never been taken.

"But the great distinction between the two is this—the sharp-nosed eel is a migratory fish, while the blunt-nosed is not. I admit that the latter has its summer and winter quarters, and it wanders about a good deal at night in search of prey; but it does not migrate to the sea in large shoals,

like the sharp-nosed eel. The annual migrations of the sharp-nosed eels take place about the end of October, always choosing a dark night. [And Nilsson corroborates all these remarks, and especially respecting the biting of the broad-nosed eel, which, as the fishermen here say, is 'arg,' savage, and 'hugger som en orm,' bites like a snake.] In the great eel fishery at Toome, on the Lower Bann, fifty to sixty tons of eels are annually caught at the season of migration. As many as 70,000 have been taken here in one night, all sharp-nosed, with the exception of perhaps a dozen, which have been mixed with them.

"What becomes of the sharp-nosed eels that descend to the sea every season—do they remain in the brackish waters of the estuaries, or do they return in small detachments at various periods? This remains to be solved. As none are observed to return, how is their supply replenished? Why, by the ascent of myriads of sharp-nosed eels next spring."

The migrations of the old eels down to the sea in October, and of the young fry up the rivers again in the summer, are as regular on these coasts as in Britain; so there is little doubt in my mind that the sharp-nosed eels descend to the sea to spawn in brackish water, and the old fish do not return to fresh water again. Mr. Young, as quoted by Yarrell, says—"They spawn in the Shin in fresh water. The old ones deposit the spawn in the summer, which becomes vivid in September or October, but remains under the gravel, in the spawning beds, until the following April or May." It would have been interesting if he had stated which eel it was that spawned in the Shin, for he only notices the habits of the *river* eels, not distinguishing the sharp-nosed from the broad-nosed.

The eel would appear to be of slow growth, attaining a length of about 12 in. during the first year, and not capable of maturing roe till about the third year.

Gen. *Conger*, Cuv.

Dorsal commencing close over, or behind the pectorals; upper jaw longest.

155. A. CONGER, Shaw. Hafs Al. The Conger Eel. D.

In form more resembling the ling, than the common eel. Colour darker; the dorsal and anal, with a black-brown edge. A specimen taken here of 5 ft. long was 1 ft. 3 in. thick; head 8 in. long; weight 22 lb.

Is taken off the southern coast of Sweden, generally at a great depth. A specimen which was taken off the Skagger Rack, was about 9 ft. long, and weighed 60 lb.

LOPHOBRANCHII. TUFTED-GILL FISHES.

Gills like small round tufts; opercle large; jaws complete and free. Are all small sea-fish.

Respecting the breeding habits of this fish, Nilsson remarks—"Ekstrom has made the singular discovery that the female deposits her roe on the body of the male, where they are fructified, and hatched out, and tended by the male, with all the care of a mother." This, however, appears to have been noticed by Jenyns as far back as 1835.

Gen. *Syngnathus*, L.

Body covered with a series of plates; seven-cornered to the anus, six-cornered to the dorsal, and four-cornered to the tail; one short dorsal; anal, ventrals, and pectorals, all present with well defined rays. Nose long, formed by a prolongation of the bones of the head; nose small, rather compressed or rounded.

156. SYNGNATHUS ACUS, L. Stora Kantnal. The Great Pipe Fish. D.

Lateral plates from the opercle to the anus 21, from thence to the tail 46. Colour: brown above, with dark and paler transverse bands; usual length 16 in.; nose compressed, smooth on the top.

Has never yet been detected on any Swedish coast, but is not uncommon off Bergen in Norway. D. 42; P. 12; A. 4.

157. S. ROSTELLATUS (N. Sp.). Lilla Kantnål.

Nose round, with a sharp edge along the top,

higher than in the last; a small keel on the back of the head; lateral plates from the gill cover to the anus 16; head shorter than the dorsal fin; greatest length 5 to 6 in. D. 34; P. 10; A. 4.

Is not rare off the Gothenburg coast, appears not to be known in Britain, unless it is the same as is considered the young of *S. acus*, which breeds when but 5 in. long. Very few females of this little species have been taken.

Nose much compressed and high.

158. S. Typhle, L. Bred Näbbad Kantnal. The Deep-nosed Pipe Fish. F. D.

Snout as broad vertically as the head; forehead flat; lateral plates 18 + 37; head much longer than the dorsal; tail fin angular; usual length 9 in.

Is the commonest of all, both in the North Sea, Cattegat, and Baltic. Goes into the deeps in May or June.

Gen. *Scyphius*, Riss.

No pectorals or anal fin; tail rudimentary or none; male bears the eggs in open cells under the abdomen. In the last genus the eggs are carried in a pouch similar to the marsupial animals. Form and body covering as in the last.

Tail fin rudimentary.

159. Scyphius æquoreus, L. Stora Hafsnål. The Æquoreal Pipe Fish. D.

The tail consists of some short strong rays, grown together, resembling that of the slow worm; body eight-cornered; nose round, straight from the tip to the middle of the eye, longer than from thence to the edge of the opercle; lateral plates to the anus, which lies under the hinder fourth division of the dorsal, 31; dorsal, one and a half times as long as the head; male 22 in. long; female 18 in.

Is common both on the south-western coast of Sweden and Norway.

Tail fin altogether absent.

160. S. OPHIDION, L. Lilla Hafsnål. The Straight-nosed Pipe Fish. F. D.

Nose round, straight from the point to the middle of the eye, just as long as from thence to the edge of the opercle; anus under the front division of the dorsal, which is nearly double as long as the head; length 6 to 8 in.; number of side plates from the gill openings to the vent 30; dorsal fin with 36 rays.

Common on the coast of the Cattegat and Baltic.

161. S. LUMBRICIFORMIS, Yarr. Krum Nosade Hafsnål. The Worm Pipe Fish (Pennant). D.

Nose bent upwards at the point; length from the tip to the middle of the eye shorter than from thence to the edge of the gills; anus lies in front of the middle of the dorsal, which is a little longer than the head; length 5 to 6 in.; dorsal with 26 rays.

This is, no doubt, identical with Yarrell's worm pipe fish, but Nilsson's opinion is, that the *S. anguincus*, Jenn., the snake pipe fish of Yarrell, is nothing more than the young of the æquoreal pipe fish.

The worm pipe fish is met with both in the Cattegat and North Sea off the coast of Norway.

Professor Fries has made the following interesting remark on the change which takes place in the young pipe fish during their growth, viz., that they are born with pectorals, the whole tail is encircled with a fin-like web, and the gills are large as in other fish.

PLECTOGNATHI. FISHES WITH SOLDERED JAWS.

Maxillaries and premaxillaries grown together.

Gen. *Orthagoriscus.*

Body compressed, short; with the tail so short as to give it the appearance of a fish cut in two; skin rough, but not spinous; dorsal and anal fins high and pointed, uniting with the caudal.

162. Orthagoriscus Molva, Schneid. Korta Klump Fisk. The Short Sun Fish, D.

Body about as high as it is long to the caudal fin; skin rough; colouring shiny silvery blue or brown; paler underneath.

Of the few examples which have been washed up on these coasts, the largest was 23 in. long, and nearly 16 in. high.

II.—CHONDROPTERYGII.

Cartilaginous ganoid fishes.

1. Cartilaginous fishes, with free gills.

Gen. *Acipenser*, L.

Body long, mailed as well as the head; longitudinal rows of osseous tubercles along the body; no teeth; four beards under the snout, which is long and tapering; one dorsal, placed far back as in the pike; upper lobe of the tail long and pointed, elevated, always much longer than the lower lobe; are large sea fish, but come up rivers, like the salmon, to spawn.

163. Acipenser Sturio, L. Stor. The Sturgeon. F. D.

Five rows of tubercles on the body; nose long, its length from the tip to the mouth 3 or 4 times the breadth of the gape. A sturgeon of 6 feet will weigh about 100 lb., of 8 feet, nearly 120 lb.

The nose of this fish becomes so broad and blunt with age, that probably the broad-nosed sturgeon (*A. latirostris*, Parn.), is nothing more than an older form of the common sturgeon.

Is taken occasionally off all these coasts, but more rarely in the Baltic and Sound than in the Cattegat and North Sea. The largest on record was 8 ft. long.

Gen. *Chimæra*, L.

Body long, without plates or scales, gradually diminishing, and ending in a long whip-like tail; nose conical; jaws

weaponed with hard bony plates instead of teeth; two dorsals, the first very high, with a high spine in front; the second one, which is continuous, is low like the anal, and both gradually diminishing, end in the thin-pointed tail; large sea fish; habitat North Sea and Mediterranean. This family stands much nearer to the rays than the sturgeons.

164. CHIMÆRA MONSTROSA, L. Vanlig Hafmus. The Northern Chimæra. D.

Body spotted with silver and brown; a brown band along the back, and a blackish rim along the dorsal; length 2 to 3 ft.; is precisely identical with the Mediterranean fish.

Is taken often off the coasts of the North Sea, Cattegat, and Sound, in 40 to 100 fathoms of water, but never in the Baltic.

2. Cartilaginous fishes, with fixed gills.

The gills are grown up fast with the skin, so that the water which is taken into the mouth goes out between them through several slits lying in a row. No gill cover.

SHARKS.

Gen. *Squalus*, L.

Body elongated, rough; tail thick, fleshy, and muscular; gills on the sides of the neck, not under; eyes on the sides of the head, and not above as in the rays; teeth flat, pointed or sharp edged; lie in several rows, usually four above and three below.

All the known Scandinavian species have two dorsals and so-called spiracula (spout holes).

Sect. 1.—PLAGIOSTOMI. Broad-mouthed Fishes.

Fam. SQUALIDÆ. 1. Dog Fish.

A.—Sharks with an anal fin.

First dorsal behind or over, never in front of the ventrals; tail even on the edge; snout short; gill openings

partly over the pectorals; the upper teeth three and the lower ones five pointed.

Gen. *Scyllium*, Cuv.

165. SCYLLIUM CANICULA, L. Små Flackig Dogg Fisk. The Small-spotted Dog Fish. D.

Reddish above; body thickly strewed with small round dark brown spots; below white; nose blunt; ventrals obliquely cut off, grown together in the male; nostrils joined to the mouth by a furrow: usual length 2 ft.

Is met with here and there, both in the Sound, Cattegat, and North Sea.

The large-spotted dog fish (*S. cutilis*, Mull.), which closely resembles this species, but is larger—the body covered with large spots, and the nostrils not joined to the mouth with a furrow—is not met with here.

166. S. ANNULATUM, Nilss. Ringlad Dogg Fisk. The Eyed Dog Fish.

Body colour reddish grey, covered with lighter rings; nose tolerably long; nostrils wide apart from the mouth, which is inwardly black; a row of serrated teeth on the top of the tail.

Is very rare in the Sound and Cattegat, more frequently taken off the north-west coast of Norway, as far up as Trondtheim.

2. Sharks.

The first dorsal placed far in front of the ventrals, the second over the anal fin; nose elongated; teeth obliquely triangular; in front convex, behind concave and serrated; tail pointed with different shaped lobes: the hindermost gill opening over the pectorals.

Gen. *Galeus*, Cuv.

Tail pointed; teeth obliquely, three-cornered, finely serrated on one edge.

167. GALEUS CANIS, Rond. Grå Haj. The Common Tope. D.

Colour grey-brown above, without spots, below white; nose tolerably long, rounded, blunt; tail with a pointed lobe at the root; hinder dorsal much smaller than the anterior one; length 4 to 5 ft.

Rare, and the few examples which have been taken in the Cattegat and Sound were all small fish.

Gen. *Lamna*, Cuv.

Tail fin semi-lunate; teeth fine, awl-shaped, with a point at the root.

168. LAMNA CORNUBICA, Yarr. Håbrand. The Porbeagle. D.

Body fusiform, rather resembling the porpoise; first dorsal large and high, far in front of the ventrals; tail very large, half-moon shaped, keeled on each side at the root; colour above blue-grey, below white; usual length 6 to 8 ft., often larger; spiracle scarcely perceptible.

Is not very rare off the south-west coasts of Sweden and Norway. Is said to be less lively than the other sharks.

Gen. *Selache.*

Teeth very small; gill openings very long.

169. SELACHE MAXIMA, Gun. Brygden. The Basking Shark.

Form rather like the last, with a keel on the sides of the tail, which, however, is much thinner and more pointed; the snout not so long or pointed; the anals larger, and the gill covers pass entirely across the throat; colour black-brown; skin rough; length 30 to 40 ft.; spiracle very small.

This is one of the largest of all the European sharks, but it is also one of the most harmless, its principal food being *crustacea*, *infusoria*, and the like. Has never yet been taken off any southern Scandinavian coast; but off Hittern and Nordmör, in the north of Norway, a regular fishery is carried

on in August. They are harpooned as they lie basking on the surface, for the sake of the oil—one bushel of liver leaving nearly one bushel of oil.

B.—Sharks without an anal fin.

1. No spine in front of the dorsal.

Gen. *Scymnus*, Cuv.

Teeth above lancet shaped; below broad and flat, obliquely edged, with the point directed backwards.

170. SCYMNUS BOREALIS, Scoresby. Håskerding. The Greenland Shark. D. F.

All the fins small; gill openings very short; shape rather resembling the last, but the tail is shorter, thicker, and much less pointed; spiracle small, at the back of the eye; skin very rough; ventrals and anals small, pointed; colour brown, with a dull blue tinge; usual length 12 to 15 ft., but in the Greenland seas often reaches 25 ft. Of all the sharks this goes up nearest to the North Pole.

Has been occasionally taken off the south coast of Sweden, but never so large as on the north-west of Norway, where they are far more common. Off Bergen they are met with in 250 fathoms. Fabricius says that when they hear voices, they come up to the surface, so the fishermen always talk low when approaching a school of fish. This is the most voracious of all the sharks. Gunnerus relates that he saw a whole reindeer taken out of the belly of a basking shark; and Fabricius found a seal, eight large cod, a ling four feet long, a great head of a halibut, and several lumps of blubber in a basking shark of fourteen feet long. It is the very tiger of the north seas, and the whale and even seals are not safe from its attacks. This is the only species which is known to come on the coasts of Finland east of the North Cape. West of the Cape we find *lamna cornubica*, *acanthias vulgaris*, and *selache maxima*.

2. A spine in front of each dorsal.

Gen. *Spinax*, Bon.

Teeth above awl shaped, with a point on each side of the root; below flat, with the point directed backwards.

171. SPINAX NIGER, Bon. Blå Kexa. D.

No anal fin; nose blunt, with the nostrils under the side edges of the point; blue-grey above, below black; body covered with fine ciliated points. This is the smallest of all our sharks; usual length 1 ft. The largest specimen noticed by Nilsson was 18 in.

Is never taken in the Sound or south of the Cattegat, but is not rare off the Bohus Land "Skärgard," and the deeps of the Norwegian coast.

There appears to be very little difference between this species and the *spinax acanthias*, Flem., picked dog fish of the British coasts, but as Nilsson remarks, strange to say, this *spinax niger* is never met with in the British seas; we must, therefore, conclude it to be a distinct species. It is, however, common in the Mediterranean.

Gen. *Acanthias*, Bp.

Teeth in both jaws, with the point turned obliquely back, forming a saw above and below.

172. ACANTHIAS VULGARIS, Riss. Vanlig Pigg Haj. The Picked Dog Fish. D. F.

Fins like the last, but there is a difference in the teeth, the shape of the nose, and the position of the nostrils, which lie between the point of the nose and the mouth; colour brown-grey above, below white; length 2 to 3 ft.

That this is the picked dog fish of British authors there appears to be no doubt, although the length given by Nilsson is double that given by Yarrell or Jenyns.

Is the commonest of all the sharks off these coasts, and is even occasionally taken in the Baltic. In the Sound they are principally caught in winter. It is generally met with

in shallower water than any other shark, and in mid-summer comes nearly to the surface in chase of viviparous blennies. This is the only species which is eaten here, and in West Finmark they not only eat the fish but use the eggs for pancakes.

Fam. RAIEDA-RISSO.

Body very much flattened, resembling in shape a disk, the two sides which meet to form the lateral angle, forming the pectoral fins; mouth, nostrils, and gill openings on the under side; eyes and spiraculæ on the upper side; tail long and thin, with the dorsal fin almost always upon it, generally very near its end.

These fish, in many respects, stand very near to the sharks.

Gen. *Raia*, Cuv.

Body rhomboidical; nose more or less elongated; the long pectorals encircle the whole of the sides of the body and head; tail small, with two small dorsals on the top of it, and one small caudal fin at the end; the bodies of all are more or less covered with small spines.

1. Blunt nosed.

Nose forming, with the exception of perhaps a small tip, a blunt angle.

Professor Fries draws a straight transverse line through the eyes, and another longitudinally between the eyes to the tip of the nose; if this last is as long or longer than the first, the ray is sharp, if on the contrary, blunt nosed.

173. RAJA CLAVATA, L. Knaggrocka. The Thornback. D.

Body above and below, covered with large spines; three rows of thick thorns along the ridge of the tail, of which the middle row are the largest, extending more or less to the body; dorsals distinct, with one or more thorns between them; usual length 2 to 3 ft.; colour variable, generally reddish grey-brown above, sparingly spotted with whitish dots, beneath white.

Common from the north of the Sound to far up on the west Norwegian coast.

174. R. RADIATA, Don. Klorocka. The Starry Ray. D. F.

Form and appearance similar to the last, but the pectorals are not nearly so angular, and the skin is smooth, except that it is studded above here and there with many conical spines, a row of which runs all along the back and the tail; smaller than the last; dorsals close together, with no spine between them.

Next to the last, is the commonest of the rays on these coasts, from the north of the Sound, up to the North Cape. Is the smallest of all the northern rays. The largest Nilsson has seen, measured but 21 in. in length, and about 12 in. in breadth. This is the only ray which is met with off the coast of Finland.

2. Sharp nosed.

(*a*). Body underneath quite white, without black spots or streaks.

175. R. CHAGRINEA, Cuv. Näbb Rocka. The Shagreen Ray. D.

Snout long and sharp; pectorals more rounded than in the thornback; body above covered with very small spines; two rows of larger ones along the sides of the tail, but none along the middle; a single row along the front of the back, and round each eye; colour cinereous brown above, white underneath; reaches a length of 3 ft. 6 in.; the breadth of such a fish will be about 2 ft. 3 in.

Rare and only accidental on these shores; has been taken on the west coast of Norway as well as in the Cattegat.

176. R. LINTEA, Fries. Blå Garus Rocka. The Sharp-nosed Ray; the White Skate. D.

Nose longer and more pointed than in any other of the rays; body above smooth, except a few rows of

spines on each pectoral, and a few more on the sides of the head. Colour always lighter, and pectorals rounder, than in the last; a row of spines along the lower part of the back, running down the middle of the tail, and another row on each side of the tail. Colour ash grey; belly pure white. Although the largest of all the rays (on account of its great thickness), the Scandinavian specimens have all been small, 20 in. long, with a breadth of about 20 in. between the tips of the pectorals.

Not uncommon off the Bohus Land coast, where the fishermen always distinguish them by their pale or whitish colour; whence their Swedish name.

(*b*). Body underneath with black spots and streaks.

177. R. BATIS, L. Slätt Rocka. The Skate. D.

Have been taken here as long as 4½ ft.; breadth 3 ft. 3 in. Colour above dusky brown; under surface grey, streaked with black; body lozenge-shaped; back without thorns, but three rows set along the tail; dorsals divided, with one or two spines between them. Differs from some members of the family in the colour of the under parts; from others by the shorter snout, and from others by the absence of prickles on the body.

Next to the starry ray, has the widest northerly range of all. Common in the Cattegat and North Sea. That they reach an immense size on these shores is proved by the fact, that on one occasion an egg-shell was fished up from a great depth, which was 13 in. long and 5½ in. broad.

178. R. VOMER, Fries. Plogjerns Rocka. The Long-nosed Skate. D.

Nose very long and pointed, nearly six times as long as the distance between the eyes; body above and below rough; no row of spines down the middle of the tail, but one on each side.

Is occasionally taken at a great depth off Jutland Reefs. Is the rarest of all the rays here, but, as the fishermen say, the largest.

Gen. *Trygon*.

Body form like the other species, but the tail is armed on the top with one long-pointed spine, serrated on both edges; no dorsal fin; caudal ends in a point like a whip.

179. T. PASTINACA, L. Spjut Rocka. The Stingy Ray. D.
Body smooth; above grey-brown; below white; nose short but pointed; attains a length of 2 ft. to 3 ft., rarely more.

Has only once been taken on any Scandinavian coast, and this was an example 15 in. long, from the tip of the nose to the spine on the tail, and about 13 in. broad between the points of the pectorals; the tail spine was 3¼ in. long, of which 2⅛ in. was free. This specimen was taken off the southern coast in July, 1849.

Sect. 2.—CYCLOSTOMI. Round-mouthed Fishes.

Gen. *Marsipobranchii*, Bp.

Gills fixed, purse-shaped, opening outwards by several apertures.

GROUP 1.—*Hyperoartia*, Mull. Nostrils lie on the upper part of the head, and lead to a blind bag without a hole through the gums.

Gen. *Petromyzon*, Art.

Body like an eel; gill openings, seven small holes in a row on each side of the neck, at the back of the eyes; mouth round, encircled with a fleshy skin, and furnished with teeth; no pectorals or ventrals, and no true anal fin; two dorsals.

180. P. MARINUS, L. Hafs Nejonögon. The Lamprey. D.F.
Dorsals close together, the hinder one not joined to the tail. Colour, marbled black, and yellow-red; dorsal distinct. The largest taken on these coasts have not been more than 2 ft. long, and about 2 in. high, weighing about 2 lb.; but they are taken much larger in southern seas.

Is met with in the North Sea and Cattegat as well as in the south of the Baltic. Has only once been taken in Finland.

This fish has the peculiarity of attacking other fish, attaching itself to their sides by its broad mouth, and sucking out their blood. This is often observed on these coasts in the rays; and old Bishop Gunnerus tells us that they will even do so with the basking shark, never leaving the body until the fish is dead.

The sea lamprey come up rivers in spring, to spawn in fresh water.

181. P. FLUVIATILIS, L. Vanlig Nejonögon. The River Lamprey. D. F.

Dusky blue above; silvery beneath; dorsals wide apart, the hinder one joined to the tail. General form like the last, but more elongated; rarely exceeds 12 in. in length, with a height of $\frac{6}{8}$ in. and a breadth of $\frac{5}{8}$ in.

Much rarer in the rivers of the south than in the middle and north of Scandinavia, where, especially in the east, they are very common. Is noticed by Widigren, in his "Fish of Lulea Lapland," as very common off that coast, so it does not appear that it is entirely confined to fresh water.

182. P. PLANERI, Bl. Igel Nejonögon. Planner's Lamprey. D. F.

Length 6 in. to 8 in. Differs from the last, which it resembles in colour, shape of the mouth, etc., in having the two dorsals placed close together, and the body being proportionably thicker; colour more blue; the lip is broad and fringed, and there is a difference in the arrangement of the teeth. Derives its Swedish name from its similarity to a leech (igel).

Is far commoner than the last, at least in the south of Wermland.

Gen. *Ammocoetes*, Dum.

Body, gills, and fin as in the last, but the mouth is only *semi*-circular, with no teeth; only a few small cirri on the

opening. On this account they cannot attach themselves by suction to any foreign object.

183. A. BRANCHIALIS, Nilss. Linål. The Pride. D. F.
Dorsals low, very wide apart; upper lip ends in a skin flap; tail pointed; colour blue-green; length 4 in. to 5 in.

Is very similar in general appearance to the young of the river lamprey, with which it was formerly confounded. Is met with in Finland, where it is considered as the young of the river lamprey. Is found in small streams both in the south and north of Scandinavia, but nowhere so common as the last. I have taken them commonly in North Wermland.

GROUP 2.—*Hyperotreta*, Mull. Nostrils lying on the top of the nose, and leading into a canal which opens backwards into the gums, over the gullet.

Gen. *Myxine*, L.

Body eel-shaped; encircled with a fin around the tail, but no other fins on the body; gill openings two, placed beneath; mouth encircled with beards.

184. MYXINE GLUTINOSA, L. Vanlig Piråal. The Myxine. D.
Red, tinged with violet; eight barbs around the mouth, of which four are on the tip of the nose. General length 12 in. to 15 in. No outwardly apparent eyes.

Is very common in shoals on the Scandinavian coast, from the south of the Cattegat up to the Polar circle. Off the Gothenburg coast they live in twenty to fifty fathoms. The *myxine* is produced from eggs which lie on the edge of a tolerably broad web, along the right side of the bowels.

GROUP 3.—*Amphioxini*, Müll. No nostrils; mouth oblong, without jaws or tongue.

Gen. *Branchiostoma*, Costa.

Body long; compressed on the sides, transparent; pointed alike at each end; has neither pectorals nor ventrals. On

the head rudiments of eyes are to be distinguished. The only species known to us is about 2 in. long.

185. B. LANCEOLATUM, Pall. Lansett Fisk. The Lancelet. D.

Is certainly the lowest type of vertebrate animals. Seems to have been first described by Pallas in 1774.

It is occasionally, but very rarely, taken off the sandy shores of the southern coast of Scandinavia.

ADDENDA TO THE SCANDINAVIAN FISH.

Since completing this list, I have seen in the last number of the "Kongl Vet. Acadam. Forhandlingar" for 1863, that two new species of thunny have just been added to the Scandinavian fauna.

AUXIS VULGARIS, Cuv. and Val. The Plain Bonito.

One specimen, 17 in. 2 l. in length, was caught in 1863, off the coast of Scania, and deposited in the Lund Museum.

The other, which has hitherto never been taken north of the Mediterranean, is the—

THYNNUS THUNNINA, Cuv. and Val.

One specimen, 2 ft. 9½ in. long, and weighing 22½ lb., was caught near Malmo in 1857.

If we now add these two new species, the Scandinavian fish will reach 187, and the above list will be correct up to 1864.

It will be seen that the fish of Sweden and Norway are . . . . . 187 species.
Denmark . . . . . 139 „
Finland . . . . . 80 „

Seven species are included in the Danish fauna, which are not known in Sweden or Norway—

Gobius microps, Kroy.

Julis vulgaris, Cuv. The Rainbow Wrasse.

Platessa laxicola. A species of flounder which I cannot make out.

Clupea schoneveldii, Bloch.

Barbus fluviatilis, Cuv. The Barbel.
Leuciscus dobula, L. A doubtful species.
Cobites fossilis, L.

And they have five species in the Finland waters unknown in other parts of Scandinavia—

Liparis lineatus, Lepech. From the coast of Lapmark.
Anarrhichas pantherinus, Pall. Probably only a variety of the common wolf fish.
Gadus havaga, Pall. } Small species of cod peculiar to
G. saida, Lepech. } the White Sea. The first is easily distinguished from the young of the common cod, which it otherwise resembles, on account of its peculiar transverse processes.
Platessa divinensis, Lilj. White Sea.

Old Artedi, in his description of the Swedish fish, in 1788, appears to have known only fifty-eight species; but he includes the whale. And Linnæus, in his "Fauna Suecica," notices eighty-five species. Old Jonas Kolding, who wrote on the Danish fishes in 1594, appears to have known only thirty-five species in the Danish waters.

That the Finland fish fauna should be so poor in the number of species, as compared with that of Sweden and Norway, may be accounted for by the fact, not only that it has a much less extent of coast, but that its principal seas, the Bothnia and the White Sea, are far less rich in even the common species of sea-fish, than either the Sound, the Cattegat, or the North Sea.

THE END.

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